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ABSTRACT

This conference focused on critical thinking, language, and inquiry across the disciplines through the perspectives of scholars and practitioners within a variety of academic disciplines. This volume reflects the thoughts of 48 authors representing 20 academic fields; it is divided into two main parts. The first part is composed of papers that address the theory of critical thinking and consists of seven sections: (1) Plenary Papers entitled "The Role of Reason in (Science) Education"; "Creative Inquiry: Critical Thinking in the Disciplines"; and "Critical Thinking across the Disciplines"; (2) Critical Thinking and Basic Theory; (3) Critical Thinking and Informal Logic; (4) Critical Thinking and Inquiry; (5) Critical Thinking Theory: Contemporary Issues; (6) Critical Thinking in the Disciplines; and (7) Critical Thinking and Teaching. The second part on critical thinking and educational practice is concerned with the application of critical thinking to undergraduate education and consists of four parts: (1) Critical Thinking and Collegiate Pedagogy; (2) Engaging Students in Critical Thinking Tasks in Academic Courses; (3) Pedagogical Approaches to Critical Thinking and Language; and (4) Critical Thinking and Language Contexts. (LL)

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Critical Thinking: Language and Inquiry Across the Disciplines

Conference 1988 Proceedings

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Conference 1988 Proceedings

Edited by

Mark Weinstein
Wendy Oxman-Michelli

Institute For Critical Thinking
Montclair State College

August, 1989

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Critical Thinking: Language and Inquiry Across the Disciplines Conference 1988 Proceedings

The Institute for Critical Thinking at Montclair State College has sponsored a conference, *Critical Thinking: Language and Inquiry Across the Disciplines*, in the hope that the field of critical thinking will be enriched through the perspectives of scholars and practitioners working within a variety of academic disciplines and from many perspectives. The papers included in the proceedings of this conference stand as an index of the usefulness of such a point of view. The volume reflects the thoughts of 48 authors representing 20 academic fields. It is divided into two main sections composed of papers that address, in Section I, theoretical issues related to critical thinking and, in Section II, those that are most concerned with the application of critical thinking to undergraduate education. The various perspectives represented here, we believe, add significant new ideas to the field of critical thinking represented primarily, to date, through the work of philosophers. In these Proceedings, the positions presented tend away from the mainstream of critical thinking and represent many new and potentially useful points of view. What we take to be of central importance are the offerings of many disciplines involved with critical thinking but underrepresented in its literature. These various approaches furnish perspectives that we believe deserve careful consideration. Despite the variety of perspectives and the multiplicity of concerns, we see all of the efforts included as being related through a sense of critical thinking that, despite its diversity of expression, points to the continuity of critical thinking across the various disciplines.

At Montclair State College we have developed a notion of critical thinking that has at its center a concern with judgment. We maintain that students should see the content of the courses within a nexus of justification and application. This requires that students learn course content in relation to the methodological and substantive principles that support that content as justifiable--that is, support the judgment that the knowledge is justified. And further, we maintain that students should be helped to link information within some domain of meaningful application, which frequently extends beyond the boundaries of the discipline itself. Knowledge taught to undergraduates should address the *theoretic reason* of the student by having the theoretic and/or empirical rational bases of that knowledgemade explicit. It should also speak to the students' *practical reason* by being related to purposes for which the knowledge has potential significance.

Knowledge essentially tied to judgment, we believe, is thus at the heart of undergraduate education. But judgment, if it is to be acceptable, must rest appropriately on good reasons. This is the core of critical thinking, and why it is essential to undergraduate education. For critical thinking constitutes the ability and willingness to identify and apply the set of principles that support judgment through the best available reasons. Such reasons, we believe, are most often found in the canons of the various disciplines. Canons include such a variety of basic beliefs and principles as ethical and methodological assumptions and practices, theories and facts that are held as unexceptionable, and genre for the presentation of results. Such canonical principles constitute the criteria used to support judgments of the most responsible sort in the various areas of inquiry. We do not, however think that such principles are unchanging or are tied to one perspective. Rather, we believe that canons for good judgment are to be found in all of the various forms of human inquiry and that they have a history that enables them to change in the light of reason and practice. We maintain that the disciplines evolve in their objects of concern and continuously develop appropriate methodologies to better understand the range of issues and topics that are at the center of academic and practical learning.

These disciplinary modes of inquiry reflect what is seen as best in the standards that govern work in the fields. But these are not univocal, neither between or within fields, nor are they arbitrary. The disciplines, at any moment, reflect the range of what has been deemed best. To the extent that they are critical in their thought, they also reflect the ongoing exploration of these methodological and substantive canons by reflection on the practice of the discipline itself, by comparison to other scholarly fields and in response to the complex universe of application that is the common reality with which all disciplines are concerned.

The connection between critical thinking, judgment and methods of inquiry of the disciplines is to be found in the analysis of critical thinkng that the Institute for Critical Thinking owes to Matthew Lipman, That is, critical thinking rests essentially on the identification and use of criteria for judgment, applied in a fashion sensitive to context, and with a commitment to ongoing self reflection and correction, This notion offers a unifying focus for critical thinking across the disciplines while recognizing the validity of responses that reflect different criteria for application within particular academic arenas.

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Critical Thinking: Language and Inquiry Across the Disciplines Conference 1988 Proceedings

Overview

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Knowledge essentially tied to judgment, we believe, is thus at the heart of undergraduate education. But judgment, if it is to be acceptable, must rest appropriately on good reasons. This is the core of critical thinking, and why it is essential to undergraduate education. For critical thinking constitutes the ability and willingness to identify and apply the set of principles that support judgment through the best available reasons. Such reasons, we believe, are most often found in the canons of the various disciplines. Canons include such a variety of basic beliefs and principles as ethical and methodological assumptions and practices, theories and facts that are held as unexceptionable, and genre for the presentation of results. Such canonical principles constitute the criteria used to support judgments of the most responsible sort in the various areas of inquiry. We do not, however think that such principles are unchanging or are tied to one perspective. Rather, we believe that canons for good judgment are to be found in all of the various forms of human inquiry and that they have a history that enables them to change in the light of reason and practice. We maintain that the disciplines evolve in their objects of concern and continuously develop appropriate methodologies to better understand the range of issues and topics that are at the center of academic and practical learning.

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I

Papers in the Theory of Critical Thinking

Critical thinking has theoretical roots in a variety of academic discplines. The recent movement, however, has been characterized by its roots in philosophy. Not only has explicit instruction at the undergraduate level in critical thinking been, predominately, a task assumed by philosophers, but its principles have been articulated by, and are reflective of, philosophical concerns. This is amply represented in the theoretical papers that comprise the first section of the *Proceedings*. All the plenarists whose papers are included in the *Proceedings* are philosophers, as are several of the other authors included in the section. It should be of interest to our readers to see the contrast and continuities between the philosphical perspectives and the perspectives of the various other disciplines represented.

This section begins with papers exhibiting philosophical concerns that have been at the center of the theory of critical thinking. It then moves away from such typical concerns and explores issues that reflect the wide range of approaches that characterize critical thinking as it occurs within various disciplines. Of particular interest to those that have been following the critical thinking literature are papers that attempt basic reconceptualizations of the foundations of critical thinking itself, in particular the two papers in the section on *Critical Thinking and Basic Theory*. At the other extreme are papers, such as those included in *Critical Thinking in the Disciplines* that offer methodological accounts of particular disciplines that extend the notions of criteria and argument in ways that have hardly been explored in the critical thinking literature.

The Plenary Papers

The plenary papers address some of the most fundamental issues in critical thinking across the disciplines. At the center of their mutual concern is the role of critical thinking as a general procedure available across the disciplines. The three featured presentations offer a variety of approaches to this problem, giving insights and suggesting possible strategies for reconciling competing perspectives.

The first plenarist, Harvey Siegel, in his paper *The Role of Reason in (Science) Education*, relates critical thinking to the disciplines through his conception of critical thinking as "being appropriately moved by reasons." Siegel takes this conception to be "general and subject-neutral. He accepts the role of "genuine subject specificity" but argues that it "does not undermine (his) characterization of critical thinkng as a subject-neutral guide to inquiry across the disciplines." Siegel illustrates the strength of his conception by pointing to its application in science and in science education.

Sharon Bailin, in her address entitled *Creative Inquiry: Critical Thinking in the Disciplines*, extends the standard account of critical thinking as exemplified in skills and dispositions, by requiring that "students understand disciplines as modes of inquiry." By doing this and by seeing the disciplines as having "criticism built into their principles and procedures," Bailin recommends that students be helped to see disciplines not as "static bodies of information, but as modes of inquiry. This will enable critical thinking to be seen in its correct relationship to creative thinking, that is, to see the centrality of "good thinking which has both generative and evaluative dimensions" to inquiry and knowledge in the disciplines. Students should understand and apply modes of inquiry of the disciplines they study, to see that "knowledge evolves, and the possibility of evaluation and innovation is afforded by the critical and dynamic nature of the disciplines."

The third speaker, Mark Weinstein, looks at the issues from the vantage point of the disciplines and their languages. Given that there is important generality to critical thinking across the disciplines, what is the relationship between the generalities and the objectives of critical thinking in undergraduate education? In his talk *Critical Thinking Across the Disciplines*, he asks whether critical thinking as currently conceived is "adequate to the educational objectives from which critical thinking takes its raison d'etre." He offers an analysis and series of examples supporting the centrality of a disciplinary perspective towards critical thinking, that is critical thinking that incorporates substantive methodolgical criteria from within the various disciplines.

The Role of Reasons in (Science) Education

Harvey Siegel

In these days of educational reform--which days seem to be always upon us, either in virtue of our desire to try something new, or to return to practices and aims once rejected but now seen as tried and true--much is made of the notion of critical thinking as a target of such reform. How to understand this notion, however, and how to conceive of its place in education, are more than a little unclear. What is critical thinking? What is it to be a critical thinker? What is the role of critical thinking in education? What is its role in inquiry? Is that role constant across disciplines, or do different disciplines utilize alternative and incompatible critical techniques? If the latter, then how can critical thinking function as a general educational ideal?

In what follows I hope to shed some light on these and other questions concerning critical thinking. I shall present a conception of critical thinking according to which critical thinking is very closely linked to the notions of *reasons* and *rationality.* I shall argue that critical thinking, so conceived, is rightly regarded as an educational ideal which is general and relevant to all disciplines. While not denying that disciplines differ, in their aims, criteria, principles of assessment, or techniques of inquiry, I shall argue nevertheless that critical thinking is rightly conceived as an ideal that transcends disciplinary boundaries, and that unifies and makes sense of the melange of discipline-bound activities and curricula that we know as education. After clarifying the notion of critical thinking and its place in education and as an educational ideal, I shall illustrate its impact on the disciplines by considering its role in science education. I shall conclude, finally, by suggesting that critical thinking, contrary to the familiar distinction drawn at the outset, is an ideal which is both new *and* tried and true.[1]

What Is Critical Thinking?

When we say that we want our students to be critical thinkers, or that we want our educational efforts to foster critical thinking, what exactly do we mean? Any sort of systematic answer to these questions requires that we focus on *reasons* and their role in thinking. To say of an episode of thinking that it constitutes critical thinking is to say something about its responsiveness to relevant reasons or rational considerations. Similarly, to say of a student that she is a critical thinker is to say that her thinking is generally carried out in accordance with, and adequately reflects due and proper consideration of, matters which bear relevantly on the rational resolution of whatever her thinking concerns. Critical thinking is thinking which adequately reflects relevant reasons; a critical thinker is one whose thinking is similarly reflective of reasons. We can say, in short, that a critical thinker is one who is *appropriately moved by reasons*, and that critical thinking is thinking which appropriately reflects the power and convicting force of reasons.

This conception of critical thinking--the 'reasons' conception--places reasons at its center; taking critical thinking as an important educational notion places reasons at the center of our conception of the nature and purpose of education. We might even go so far as to say that critical thinking is properly regarded as a fundamental educational ideal which informs the entire range of our educational activities and aspirations. On such a view reasons are central to our educational efforts, and those efforts are conceived as having as their ultimate aim the fostering of rationality. But what is it to be 'appropriately moved by reasons?' Again, but in more detail: what is it to be a critical thinker? According to the reasons conception, critical thinking involves two essential components: skills and abilities of reason assessment, and the 'critical spirit.'

Reason Assessment

The first component of critical thinking involves skills and abilities of ***reason assessment***. For students to be critical thinkers, they must be able to evaluate the ability of considerations offered as reasons to provide warrant or justification for the conclusions, claims and judgments for which the considerations are offered as reasons. Considerations offered as reasons sometimes constitute genuine reasons for the claims and judgments they are alleged to support; sometimes, however, putative reasons fail to afford support for those claims and judgments. Some genuine reasons offer only weak support; others offer strong or even conclusive justification. For example, the putative reason

(1) The Bible says so

offers no support for the claim

(2) The Bible is the divine word of God

because (1) assumes what it attempts to establish: namely, that the Bible is a reliable source of information concerning its own authorship. If the Bible is not the divine word of God, then the fact that the Bible says of itself that it is the divine word of God offers no warrant at all for the claim that it is--any more than this paper, if it said of itself that it is the divine word of God, would afford any warrant for the claim that the author of this paper is not Siegel, but God. In general, self-declarations of divinity afford no warrant for the divinity of such declarations; if we seek warrant for (2) we must look elsewhere for reasons which warrant (2)--say, to circumstances surrounding the authorship of the Bible that tend to rule out human (or other non-divine) authorship. (1), then, is a putative reason for (2) which fails to provide any reason for believing (2). A critical thinker must be sufficiently adept at reason assessment to recognize the failure of (1) to count as a reason for, or genuinely warrant, (2).

This last example illustrates the case in which a putative reason fails to constitute any sort of reason at all, and fails to afford any warrant at all, for the claim it alleges to support. Many putative reasons do offer some support for judgments and claims, however; such putative reasons are genuine reasons. Here the task of the critical thinker is to judge the strength of the warrant afforded by the reason for the conclusion; the degree to which the reason supports the relevant judgment or claim. For example,

> (3) Smith, a Nobel Prize winner in physics, teaches at Dalhousie

supports,[2] but only weakly supports,

> (4) Dalhousie has an excellent undergraduate program in physics;

but (3) very strongly supports

> (5) The Dalhousie physics faculty includes at least one Nobel Prize winner.

supports (5) very strongly, although not conclusively: it is possible, for example, that Smith teaches in the chemistry department but that her research overlaps chemistry and physics sufficiently that she won the Prize in physics; similarly, it is possible that a researcher of Smith's stature enjoys a University appointment and has no official tie to the Physics Department. These possibilities (and others like them) are sufficient to establish that (3) does not *guarantee* (5); it is possible for (3) to be true and (5) false. Nevertheless, (3) strongly supports (5): if Smith in fact teaches at Dalhousie and has won the Nobel Prize in physics, then it is quite likely that Dalhousie's physics faculty includes at least one Nobel Prize winner.

The relationship between (3) and (4), however, is different. (3) offers some support for (4): the fact that Dalhousie has such an eminent physicist on the faculty as Smith provides some reason to think that there are other high quality physicists at Dalhousie (if not, why would Smith stay?), and that at least some of them, perhaps Smith herself, teach undergraduates. However, it may be that Dalhousie has neglected undergraduate physics instruction for graduate and post-graduate activity; it may be that an eminent figure such as Smith does not teach at all, let alone teach undergraduates, but rather devotes her time entirely to research. We could embellish the example further if we wished, but such embellishment would be unnecessary for present purposes. The point is simply that (3) supports both (4) and (5), and is a reason for both, but supports them to different degrees. (3) strongly supports (5), but only weakly, or at least less strongly, supports (4). To recognize this, a critical thinker must be able to assess the degree to which a reason supports or warrants a claim or judgment; she must be able, that is, to evaluate the power of reasons to warrant conclusions. She must be able to tell whether a putative reason offers any justification at all for a claim or judgment, and if so, how much support it offers. A critical thinker must, that is, be able competently to assess the power and convicting force of reasons. This is what is involved in the reason assessment component of critical thinking.

What must the critical thinker master in order to be a competent evaluator of reasons? How does she know that (1) does not support (2) at all, that (3) weakly supports (4), and that (3) strongly supports (5)? The short answer is that the critical thinker must master a variety of *principles of reason assessment.* She must know, understand, and know how to apply a variety of such principles.

Principles of reason assessment come in all shapes and sizes. Consider, for example, the judgment that (1) does not support or constitute a reason for (2). (1) fails to support (2) because it begs the question: (1) supports (2) only if one thinks that the fact that the Bible says so (i.e. says of itself that it is the divine word of God) in some measure establishes the truth of what it says (i.e. that it is the divine word of God). But saying so establishes the truth of what is said only if one has some reason for thinking that its utterances are reliable, and the main reason for thinking that those utterances are reliable is exactly that the Bible is alleged to be divinely authored. If divinely authored, then the fact that the Bible says of itself that it is the divine word of God does provide reason--very strong reason indeed, given our conception of God--for thinking that what the Bible says is true, i.e. for thinking that it is in fact divinely authored. But if not divinely authored (or other-wise authoritatively authored with respect to questions concerning the divinity of authorship), then (1) fails to provide any reason for (2). (1) supports (2), then, only insofar as we assume or have reason to think that (2) is true. (1)'s status as a reason for (2) rests, then, on assuming the truth of (2). But then (1)'s status as a reason for (2) depends upon assuming exactly the point (1) is supposed to establish: (1) constitutes a genuine reason for (2) only insofar as we antecedently accept (2). This is exactly the fallacy known by logicians as begging the question: assuming in one's premises the very point at issue that one's premises are supposed to establish, or for which they are supposed to constitute reasons. Here we appeal to a principle of reason assessment to assess the ability of (1) to support (2), and we find, when doing so, that (1) fails to constitute a reason for (2). The principle in question might be stated as

(P): Putative reasons which beg the question, i.e.
which assume the very point for which they are offered as support, fail to warrant or to constitute reasons for that point.

Notice that this principle is entirely subject-neutral. It does not presuppose specialized knowledge of any discipline or field, nor is its application restricted to any selected field. Begging the question is as much a fallacy in history as it is in chemistry, in photography as much as in deciding whether to vote for Mulroney in the next election. Some principles of reason assessment, then, are general and subject-neutral. These are the principles studied by the field of logic--both formal and informal--and constitute one major type of principle of reason assessment. Other principles of reason assessment are subject-specific. To know that

(6) The battery is dead

counts as a reason for

(7) The car won't start,

one must know something about cars and the workings of internal combustion engines; similarly, to know that

(8) Her skin is yellow

counts as a reason for

(9) Her liver is not functioning properly

one must know something about human anatomy and physiology. The point here is simply that some principles of reason assessment apply only in specialized domains, and require specialized knowledge. Principles of reason assessment can be either subject-neutral or subject-specific. To the extent that a student is a critical thinker, she knows, understands, and knows how to apply both sorts of principles of reason assessment. Critical thinking, consequently, is wrongly construed as either entirely subject-neutral or entirely subject-specific. It is both. Arguments over whether it is one or the other, then, are not particularly enlightening or important.[3] Similar remarks apply to those who urge that critical thinking is thinking which is context-dependent, rather than context-independent: critical thinking is sometimes context-dependent, and sometimes not.[4]

The main point here is simply that critical thinking centrally involves reason assessment, and that a student is a critical thinker only insofar as she is a competent assessor of the power and convicting force of reasons. To be so competent, she must have an intellectual and functional mastery of a large and disparate variety of principles of reason assessment.

The Critical Spirit

Suppose that a student is able to assess reasons competently. Is she then a critical thinker? No. Competent reason assessment is a necessary, but not a sufficient, condition of critical thinking. To be a critical thinker one must not only be a competent assessor of reasons; one must also possess a *critical spirit.*

The ability to assess reasons is not sufficient for critical thinking, for it is easy to imagine people who are quite competent at reason assessment, but who fail to exercise that competence. The case of the brilliant professor who gets fooled by the used car salesperson is one stereotype of such a person; a sophist is another; a politician who uses her skills of reasoning to favor her own ends or to protect her basic principles from critical assessment is still another. In all these cases, the person in question fails to utilize her critical abilities in ways which fairly treat the subject matter at hand.

The critical thinker, in contrast, is one who not only has highly developed skills of reason assessment, but is also *disposed* to utilize them. She has a tendency, and a willingness, to demand reasons and evidence for judgments and actions under consideration; she has a disposition to question even--perhaps especially--her own most fundamental beliefs and attitudes. She has certain habits of mind, and a certain sort of *character*: namely, one which takes as central the demand, and quest, for reasons, and which manifests a desire to conform belief, judgment and action to the results of the fairminded evaluation of reasons. She must love and respect reasons, and live her life accordingly. A person who does not have the dispositions, habits of mind and character traits constitutive of the critical spirit does not qualify as a critical thinker, however adept at reason assessment she might be. Similarly, a person with the critical spirit, but without the ability to assess reasons, also fails to be a critical thinker. Both components of critical thinking--the reason assessment component, and the critical spirit component--are necessary for critical thinking; they are only jointly sufficient. So understood, the ideal of critical thinking is the ideal of a certain sort of *person* as much as a certain sort of thinking.[5]

Critical Thinking as an Educational Ideal

To take critical thinking as a fundamental educational ideal is to place reasons, and rationality, at the center of our educational conceptions and endeavors. In striving to foster critical thinking, we are striving to foster both skills of reason assessment and the critical spirit; insofar, we are striving to bring about a certain sort of person, with certain sorts of dispositions and character traits, as well as a certain sort of education. This befits a philosophical characterization of a fundamental educational ideal, since education fundamentally involves the persons we strive to educate, and our best hopes for those persons. It involves, that is to say, our ideals of the educated person.[6]

But the ideal sketched thus far is not yet entirely clear. I have argued that the critical thinker is one who is appropriately moved by reasons, and have spelled out this conception in terms of the dual components of abilities of reason assessment, and critical spirit. We must ask next how each of these components relates to the characterization of critical thinking in terms of being 'appropriately moved by reasons'. Doing so will force the recognition of an ambiguity concerning that phrase. Treatment of this ambiguity will force the drawing of a distinction which will further clarify the reasons conception of critical thinking.

Two Dimensions of Being 'Appropriately Moved By Reasons'

What is it to be 'appropriately moved by reasons'? There are, I think, two different aspects of being so moved, which can be isolated and identified by emphasizing each of the first two words of that phrase in turn.

To be *appropriately* moved by reasons is to have one's beliefs, judgments and actions conform to the degree of support afforded them by reasons. In the context of our earlier examples, I am appropriately moved by reasons if I do not believe (2) on the basis of (1); if I judge (4) to be somewhat likely on the basis of (3); and if I confidently act consistently with (5) on the basis of (3). In each of these cases, I am *appropriately* moved because my belief, judgment and action is shaped and controlled by the power of the putative reasons in question to warrant the relevant beliefs, judgments and actions. In contrast, if I believe (2) on the basis of (1), and thus do not recognize that (1) begs the question (or recognize it but do not care), I would be *in*appropriately moved by reasons, in that my belief does not conform to or adequately reflect the force of the reasons offered in support of that belief.[7] The general point concerning appropriateness is this: reasons stand in certain evidential or probative relationships to the beliefs, judgments and actions for which they are reasons; reasons have *probative* or *evidential force.* To be *appropriately* moved by reasons is to believe, judge and act in accordance with the probative force possessed by one's reasons. Here the fundamental task of the critical thinker is to assess accurately the probative force of reasons. What one is assessing, when one is assessing reasons, is the probative force of those reasons. This is the role of the reason assessment component of critical thinking.

This component is not sufficient for critical thinking, however, because (as we have seen) I may realize that (1) fails to support (2) but believe it anyway; I may realize that (3) strongly supports (5), believe (3), yet fail to act as if (5) were true. In such cases my powers of reason assessment are functioning properly, but I fail to conform my belief, judgment and action to the probative force of the reasons I have adequately assessed. Here I fail to be appropriately *moved* by reasons. To be appropriately so moved, I must *be moved* appropriately: I must not only recognize the probative force of reasons; I must also recognize the *normative impact* of reasons. That is, I must actually conform my beliefs, actions and judgments to the strength of relevant reasons. The critical spirit can and should be seen as that component of critical thinking which sees to it that one is *affected* and *influenced* appropriately by the probative force of reasons. One recognizes and is open to the normative impact of reasons insofar as one is disposed to conform belief, judgment and action to the probative force of reasons, and insofar as one has a character such that one typically is, and seeks to be, appropriately moved by them.

There are, then, two dimensions of being 'appropriately moved by reasons.' One must be *appropriately* moved by reasons; and one must be appropriately *moved* by reasons. These two dimensions are captured by distinguishing between the *probative force* and the *normative impact* of reasons.[8] Reasons have both probative force and normative impact; the critical thinker is appropriately moved by reasons insofar as she recognizes, and conforms to, both aspects of reasons. Both aspects of reasons are crucial to being appropriately moved by them.

Critical Thinking and the Language of Inquiry

Earlier we considered the generality of critical thinking; we recognized then that some principles of reason assessment are not general but are subject- or context-specific. Nevertheless, there is an important sense in which critical thinking is general and subject-neutral (in addition to the point that some principles of reason assessment are). I shall try to articulate that sense in terms of a 'language of inquiry.'

Inquiry is not univocal. We inquire into many different matters, in many different ways. Inquiry concerning the precise determination of the charge of an electron is conducted in quite a different way from that concerning the large-scale geometry of the universe; inquiry concerning the etiology of AIDS involves techniques (e.g. of observation) and theories (e.g. of virology) quite different from inquiry concerning the values of cultures very different from our own. Similar remarks apply to inquiry concerning the virtues of Presidential candidates and the defects of cars that won't start. All of these cases are cases of inquiry; all of them utilize very different techniques. Understood in terms of *techniques* of inquiry, there is no common *method* of inquiry.[9]

Nevertheless, there are some aspects of inquiry which are constant across different types of inquiry. For example, in all the scientific examples just mentioned, observations--whether made with the naked eye, telescopes, electron microscopes, or glasses--are integral ingredients of each of the several inquiries. Moreover, these observations play similar roles in these various inquiries: for instance, we make observations to test hypotheses concerning the geometry of space-time, the structure of the HIV virus, the charge of an electron, the meaning of a foreign cultural practice, the car's failure to start, and the desirability of a political candidate. In all these cases, observations provide reasons for thinking that our hypotheses and theories are true, acceptable, worthy of belief, false, not worth further investigation, or not worth believing. Other aspects of the activity of inquiry, e.g. hypothesizing, theorizing, inferring, imagining, and testing, also provide reasons for conclusions concerning the objects of inquiry. In all these sorts of inquiries, then, there is a common structure--one that defines the effort to inquire responsibly and effectively into the matter at hand--and a common language as well. The common language is just the language of critical thinking, or, more simply, the language of reasons.

The language of inquiry, I am claiming, just is the 'language of reasons.' It is the totality of our linguistic apparatus relevant to the conducting of responsible inquiry and the establishment of warrantable and warranted hypotheses. Specific linguistic conventions might be adopted by investigators in disparate areas of inquiry, just as different domains of inquiry may differ with respect to relevant principles of inquiry and assessment. For example, a physicist might say that she 'sees' neutrinos in a way in which non-specialists cannot;[10] a mathematician, a biologist, and a non-scientist might mean different things when each claims to have 'proved' something; members of different schools of literary theory may disagree over whether an author's intentions count as 'evidence' concerning the meaning of a work. Similarly, 'empathy' may be part of the language of inquiry of the cultural anthropologist but not of the particle physicist; 'intention' may be part of the language of inquiry of the historian but not of the cell biologist; 'cell' may be part of the language of inquiry of the biologist but not of the psychologist or cosmologist. With respect to these and similar considerations, we can speak of different languages (and principles) of inquiry operating in different disciplines and inquiry situations.

Nevertheless, inquiry can and should be conceived as fundamentally the same activity across contexts: namely, the activity of investigating matters relevant to responsible belief, judgment and action. Inquiry is in this basic way univocal. It involves the creation[11] and critical examination of reasons and their power to warrant hypotheses; and it results, ideally, in belief, judgment and action which conform to the results of such critical examination. The language of inquiry is similarly univocal. Just as there can be a univocal scientific method which stands alongside and makes sense of diverse techniques of scientific investigation,[12] so too there can be a univocal language of inquiry, which stands alongside and makes sense of diverse 'languages' and principles which function in diverse disciplines and areas of inquiry. The univocal language of inquiry is the language of critical thinking--the language of reasons--which empowers us to comprehend diverse disciplinary activity as inquiry in specialized disciplinary settings, to make sense of the fruits of discipline-bound inquiry, to extend the results of such inquiry beyond the bounds of its narrow disciplinary home, and to evaluate critically those results in a broader extra-disciplinary context. All this is possible only because there is a language of inquiry, and a conception of inquiry which makes sense of that language, which extends far beyond the 'languages' of inquiry utilized in the disparate disciplinary arenas in which specialized inquiry takes place. The task for investigators of the many 'languages of inquiry' is just to relate those 'languages' to the language of reasons.[13]

The Language of Reasons and Science Education

If the account of critical thinking offered thus far is correct, then it should tell us something about science education and its proper pursuit. I believe it does.[14]

Taking critical thinking as a fundamental educational ideal has fundamental ramifications for science education and for our conception of the science curriculum. Science education, in this light, involves primarily the ability of science students to evaluate, appreciate the force of, and be moved by reasons in science. *Reasons in science* is on this view the key to science education.

To regard reasons as a key component of science education is to reject the view of science education that Schwab derides as a 'rhetoric of conclusions'; it is also to reject the related view of science education, inspired by Kuhn, as one which aims at indoctrinating students into the reigning paradigm of the day.[15] It is rather to envision science education as aiming at providing students with an understanding of the reasons we have for favoring one theory over another; for conducting this experiment rather than that; for constructing it this way rather than in some other way; for interpreting results in one way rather than another; and so on. This sort of education calls for the active consideration and comparison of alternative, rival theories and hypotheses. It also calls for sustained, explicit attention to the methodology of scientific inquiry as a means of establishing the rational warrant of alternative claims and hypotheses. A *critical* science education aims at fostering in students an understanding of the strengths and weaknesses of alternative hypotheses; that is, an understanding of the reasons which ground our evaluations of those alternatives. A science student who has such understanding has an understanding of the criteria and principles which determine the character and strength of putative reasons in science. Such a student has a grasp of the way in which theoretical calculation, experimental design, and experimental result provide us with reasons for preferring one theory or hypothesis to another; she has as well an understanding of the principles of reason assessment, utilized in science, which ground the assessment of such reasons. In order to have this sort of understanding, she must have some understanding of the epistemology/philosophy of science, and a critical science education should include explicit and sustained attention to philosophical and methodological considerations which underlie scientific practice. Otherwise our student will have at best only a shallow understanding of why some particular experimental result strongly favors one theory, why another result only weakly favors a rival, or why another result fails to support some other rival at all. Philosophy of science consists in large part in the study of the warranting force of reasons in science--issues concerning methodology, experimental design, confirmation, induction, falsification, the logic of science, explanation, progress, and the rationality of science all touch in more or less direct ways on the power of reasons to warrant scientific hypotheses. A critical science education aims at empowering students to understand the rational status of scientific hypotheses and theories by providing an understanding of the principles and considerations which ground our assessment of those hypotheses and theories. An awareness of philosophical controversies concerning such considerations--e.g., concerning the nature of explanation and the relevance of explanatory power to the rational evaluation of theory, or concerning the problem of induction and the confirmationist/falsificationist controversy over the ability of evidence positively to support theories--can only enhance the ability of students to understand the nature and warranting force of reasons in science. Thus the philosophy of science should be an integral part of the science curriculum, just as epistemology should be an integral part of the critical thinking curriculum.[16]

A critical science education, then, rejects the Kuhnian suggestion that we should distort the history of science to hide major theoretical controversies and differences in conceptualization of scientific domains and of problems in need of investigation; rejects the idea that the aim of science education is the production of students who believe the theories we tell them are 'correct'; and rejects a science education which results in students who are blind to their own theoretical commitments. A critical science education, on the contrary, emphasizes the active consideration of alternative theories and hypotheses; the critical evaluation of those alternatives, and the philosophical considerations which underlie such evaluation. In all of this, the quest for an understanding of the nature and role of reasons in science is central.

In this respect, moreover, the language of inquiry in science is simply the language of reasons applied to various specialized scientific domains of research. So far, my suggestions concerning science education extend naturally to other curriculum areas. The focus on reasons in history is central to critical history education; the focus on reasons in literature is central to critical literature education, and so on. In all curriculum areas, an education which fosters critical thinking in those areas emphasizes the nature and role of reasons, the active consideration of alternative theoretical and critical perspectives, and the philosophical issues and concerns, studied by the philosophy of[17] the relevant discipline, which inform our understanding of the principles governing the evaluation of reasons in those areas. I hope, then, that my remarks concerning science education can be generalized to other curriculum areas. While there are surely differences between such areas--what counts as a reason in literature may well differ from what counts as a reason in biology, and the language with which such reasons are discussed and understood may differ equally as much--the language of inquiry and of reasons is nevertheless central to inquiry, and to education, throughout the curriculum.

The Role of Reasons in Education

I conclude with a plea for the recognition of rationality, and its educational cognate, critical thinking, as a fundamental educational ideal; and for the recognition of the central role which philosophical theorizing concerning education should play in our conception and understanding of educational affairs.

One of the basic problems with education, and its scholarship, is the 'fad' phenomenon: the rapid adoption and rejection of new, global

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educational panaceas. This is a phenomenom with which we are all only too familiar. A major explanation of this phenomenon is the failure of education to be informed by any enduring, underlying philosophical perspective. I should of course be delighted if the view I have argued for here came to constitute that enduring perspective. But wouldn't I be fooling myself if I thought that any philosophical view--even my own--will endure? Aren't there philosophical as well as educational fads?

Perhaps there are. Moreover, there is no question that critical thinking is in many respects a new idea, and that the contemporary critical thinking 'movement' bears many of the marks of an educational fad. Nevertheless--to hark back to my introduction--I think that critical thinking is best regarded as an educational ideal which is both new *and* tried and true.

Critical thinking is undoubtedly in many respects a new educational idea. It is recognized and thought of as a 'movement'--the Critical Thinking Movement--and has been the subject of many national and international conferences, several new journals and newsletters, and a host of newly designed curricular materials; it has given rise, in turn, to an army of experts and authorities on the theory and practice of critical thinking; and grand promises for the virtues and benefits of making critical thinking central to our educational endeavors have been made. In all this critical thinking looks very much like another education fad and putative panacea. If it were just another fad, moreover, then I think we would have good inductive evidence concerning its power and potential for transforming and radically improving education. This evidence would not be in its favor.

However, critical thinking is not simply new. It is also an educational ideal with impressive philosophical credentials. Throughout the history of Western philosophy, major philosophers of education have articulated, endorsed and defended educational visions to which critical thinking has been central. Socrates is perhaps the clearest example of a philosopher who urged that education and society strive to imbue in all students and persons, to the greatest extent possible, the skills, dispositions and character traits constitutive of critical thinking. Plato similarly venerated critical thinking and rationality, although he was a bit less sanguine concerning the degree to which the ideal could be successfully realized. Aristotle too championed rationality, both in theory and in practice, and uttered remarkably modern-sounding ideas concerning education's duty to develop character traits we now associate with the critical thinker. The great philosophers of the Middle Ages, no less than those of Antiquity, similarly championed an education aimed at the fostering and development of rationality, believing it to be requisite for a full realization of Christian faith. Locke, Hume, Kant, Rousseau, Mill, and other great figures of the Modern and Enlightenment periods also venerated rationality and praised it as an educational aim, the realization of which would enable humans to achieve their full potentential as rational beings. More recently, Bertrand Russell extolled and defended the virtues of an education in service of the ideal of critical thinking;[18] and

John Dewey developed a highly refined philosophy of education which placed rationality, reasons, and critical thinking at its center.[19] More recently still, R.S. Peters and his British associates endorsed a version of the ideal of critical thinking, and placed reasons and rationality at the heart of their educational philosophy; and the preeminent contemporary philosopher of education, Israel Scheffler, conceives of critical thinking as being 'of the first importance in the conception and organization of educational activities.'[20] In short, from Socrates to the present day, philosophers of education have by and large championed rationality and critical thinking as fundamental educational desiderata. Critical thinking is thus an ideal which is both new *and* tried and true.

Of course, critical thinking's being tried and true among philosophers is quite different from its being tried and true for having been tested in the crucible of educational practice. It has not been so tested. This failure to ground educational practice in enduring philosophical thought is one main reason for the sorry state of contemporary education, and for the ubiquity of the fad phenomenon. But it is also a reason for being excited about the way in which critical thinking is new. Perhaps, as a faddish educational movement, critical thinking will have its chance to inform educational practice. If so, then all of us will have the chance to see what philosophers of education have seen and said for so long.

REFERENCES

1. Some of what follows draws upon my *Educating Reason: Rationality, Critical Thinking, and Education* (London: Routledge, 1988). I refer the reader to this source for a more systematic treatment of critical thinking, its relationship to rationality, its status as an educational ideal, and its ramifications for educational policy and practice and for the curriculum.

2. I am assuming here that (3) is itself justified; if it is not, then of course it fails to support either (4) or (5).

3. The main protagonists here are John McPeck (subject-specific) and Robert Ennis (subject-neutral). I discuss the debate between them in more detail in *Educating Reason, op. cit.*

4. Here I am thinking mainly of Matthew Lipman, who emphasizes in his account of critical thinking its context-dependency. See for example Lipman, 'The Concept of Critical Thinking', *Teaching Thinking and Problem Solving*, vol. 10, issue 3, May-June 1988, pp. 5-7.

5. This discussion of the critical spirit is far too brief to be adequate. For further amplification, see *Educating Reason, op. cit.*

6. Here too my discussion is unduly brief. For further consideration of critical thinking as an educational ideal, see *Educating Reason.*

7. My belief in this case fails to be 'proportional to the evidence,' or, more accurately, fails to be proportional to an adequate evaluation of the evidence. The general position I am sketching is *evidentialist*; I regret that space forbids consideration of the many epistemological niceties concerning the desirability of conforming belief to the evidence and those concerning the 'ethics of belief.' For a recent, sophisticated statement of evidentialism, see Richard Feldman and Earl Conee, 'Evidentialism", *Philosophical Studies* 48, 1985, pp.15-34.

8. I first drew this distinction in 'Teaching, Reasoning, and Dostoyevsky's *The Brothers Karamazov*', in Philip Jackson and Sophie Haroutunian-Gordon, eds. *NSSE Yearbook: Yearbook of the National Society for the Study of Education*, 1988, in press.

9. The distinction between methods of inquiry versus techniques of inquiry is drawn, in connection with the rationality of science, in my 'What is the Question Concerning the Rationality of Science?, *Philosophy of Science* 52, 1985, pp. 517-537.

10. See Dudley Shapere, 'The Concept of Observation in Science and Philosophy', *Philosophy of Science* 49, 1982, pp. 485-525.

11. Thus it would be a mistake to sharply distinguish creative and critical thinking. See here Sharon Bailin's excellent *Achieving Extraordinary Ends: An Essay on Creativity*, Dordrecht, Martinus Nijhoff, 1988.

12. As I argue in 'What is the Question Concerning the Rationality of Science?', *op.cit.*

13. And to epistemology, i.e. to the general philosophical study of the power and convicting force of reasons. Here the close relationship between critical thinking and epistemology should be apparent. I develop this theme in 'Epistemology, Critical Thinking,and Critical Thinking Pedagogy', *Argumentation* 1989, in press.

14. In this section I borrow from *Educating Reason, op. cit.*, chapter six, which discusses in detail the differences between 'critical' and 'uncritical' science education; and from 'The Rationality of Science and Science Education', *Synthese* 1989, in press.

15. The relevant texts here are Joseph J. Schwab, *The Teaching of Science as Enquiry*, Cambridge, Harvard University Press, 1962; and Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Chicago, University of Chicago Press, 1970. For discussion of both, see *Educating Reason, op. cit.*, chapter six.

16. See 'Epsitemology, Critical Thinking, and Critical Thinking Pedagogy', *op. cit.*

17. See Israel Scheffler, 'Philosophies-of and the Curriculum', in J.F. Doyle, ed., *Educational Judgements*, London, Routledge & Kegan Paul, 1973, pp. 209-218.

18. This somewhat unusual interpretation of Russell's philosophy of education is I think conclusively secured by Dalhousie's own Professor William Hare. See his 'Russell's Contribution to Philosophy of Education', *Russell* 7, 1987, pp.25-41.

19. Although Dewey's understanding of these notions, and the epistemology underlying them, differs markedly from my own. For brief comment, see my remarks on Dewey in *Educating Reason, op. cit.*

20. Scheffler, *Reason and Teaching*, London, Routledge & Kegan Paul, 1973, p. 1.

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Creative Inquiry: Critical Thinking in the Disciplines

Sharon Bailin

The theme for this conference, "Critical Thinking: Language and Inquiry in the Disciplines", offers us a number of very rich concepts just waiting to be explored; and in what follows I would like to take up and explore three of these, critical thinking, inquiry, and the disciplines. I would like to examine how we conceptualize critical thinking, how critical thinking is connected with inquiry, and what the analysis of these two concepts can tell us about the nature of the disciplines. But in order to accomplish this, I would like to bring in yet another concept, that of creativity. I believe that in examining how critical thinking is related to creativity, some important insights can be gained about the nature of critical thinking, about the process of inquiry, and about the nature of disciplines. What I shall argue is that critical thinking in the disciplines constitutes a form of creative inquiry, and that this has implications for how we think about creativity, how we think about critical thinking, and how we conceive of the task of teaching in the disciplines.

The Standard View of Creativity

It has not, in general, been the theorists who formulate conceptions of critical thinking who have been engaged in devising theories about creativity. Rather, views about the nature of creativity have tended to emanate from the field of psychology, elaborated and reinforced by research in other areas such as aesthetics and philosophy of science. But such views have definite implications for the nature of critical thinking and so deserve sustained philosophical scrutiny by critical thinking theorists. Although passing mention of creativity is sometimes made by these theorists, the precise relationship between critical thinking and creativity tends not to be explored in any detail. But this relationship is crucial, both for our thinking about creativity and for our thinking about critical thinking.

Although there are some differences in detail among the accounts of creativity generated in the various areas, nonetheless a fairly consistent conception of the nature of creativity does emerge. There are a number of salient common features among these views and shared beliefs about the nature of creativity. One common belief is that creativity is intimately connected with originality understood in terms of the generation of novelty. Creativity is seen to involve that which is new, divergent, and disconnected with the usual, the ordinary, the accepted. Thus it is thought to involve a radical break with the past and with existing traditions, and a fundamental change in conceptual frameworks.

This belief regarding the discontinuity involved in creativity is the basis of another of the common assumptions, that the value of creative products cannot be objectively determined. If creativity is characterized by a radical break with past traditions and their accompanying conceptual schemes, then it appears that there are no standards according to which creative works can be assessed, and that their evaluation is problematic.

The discontinuity thesis also leads to the belief that the creation of creative products is characterized by a specific process or mode of thinking. If creativity involves radical novelty and a discontinuity between conceptual frameworks, then the mode of thinking which is effective within a framework will be ineffective in breaking out of the framework. Thus two distinct modes of thinking are posited, critical thinking and creative thinking. Critical thinking is seen as the process of arriving at assessments within the confines of the prevailing framework. It is the means for making reasoned judgments within the framework based on the standards of assessment inherent in the framework. It is thus viewed as strictly analytic, evaluative, selective and highly rule-bound. Given the necessary information from within the framework and the appropriate techniques of reasoning, arriving at judgments is almost algorithmic. In thinking critically one is, however, confined to the specific framework. Because it is circumscribed by the logic of the framework, critical thinking cannot provide the means to transcend the framework itself nor to question its assumptions. It cannot generate knowledge. De Bono puts the point as follows: "Logical thinking can never lead to that alteration of sequence that leads to the 'insight' rearrangement of information.... Logical thinking may find out the best way of putting together A, B, and C but it will not discover that A, B, and C are inappropriate units anyway." [1]

Creative thinking, on the other hand, is viewed as precisely the type of thinking which can transcend frameworks and issue in creative products. It is inventive, imaginative, and involves the generation of new ideas. Because it involves breaking out of old frameworks, creative thinking is thought to exhibit characteristics which are precisely the opposite of critical thinking. It is strictly generative, spontaneous, and non-evaluative. It involves divergent thinking, rule-breaking, the suspension of judgment, and leaps of imagination. And, instead of being characterized by logic or appeal to reasons, it relies heavily on intuition and unconscious, non-rational processes. This dichotomy is evident in Koestler's contrast between disciplined thought and the creative act: "ordered, disciplined thought is a skill governed by set rules of the game, some of which are explicitly stated, others implied and hidden in the code. The creative act, in so far as it depends on unconscious resources, presupposes a relaxing of the controls and a regression to modes of ideation which are indifferent to the rules of verbal logic, unperturbed by contradiction, untouched by the dogmas and taboos of so-called common sense." [2]

There is a story which nicely illustrates this dichotomy between critical and creative thinking. There were two students out walking in the forest when they noticed, approaching them rapidly in the distance, a very ferocious and very hungry-looking bear. Well, the first student hastily did up her running shoes, in preparation for flight. But the second student, who was a critical thinker, did no such thing. Rather, he set about reasonably deciding what to do, and so he proceeded to evaluate the available information. He calculated the velocity of the bear, its angle of approach, the maximum speed of humans running without the aid of steroids etc. Finally he turned to the first student and said, "It's no use running. I've just figured it out, and there is no way that we can outrun that bear." But the first student, who was a creative thinker, shouted back over her shoulder as she took off, "I don't have to outrun the bear. I only have to outrun you!"

Critique of the Standard View

i) Two distinct kinds of thinking

According to the standard view of creativity, then, there are two distinct kinds of thinking, creative thinking, which is strictly generative and issues in creative products, and critical thinking, which is strictly evaluative and deals with the assessment of ideas and products. I would maintain, however, that there are not two distinctive and opposite kinds of thinking, one leading to creative achievement and the other involved in the evaluation of products. Rather, there are analytic, highly judgmental aspects to generating creative results and imaginative, inventive aspects to being critical and it is exceedingly difficult to separate out two distinct and opposite kinds of thought.

First, I think that it can be shown that the generation of creative products requires considerable evaluation. Innovation must be viewed in terms of creating products which are not simply novel, but also of value in terms of meeting a need, or solving a problem, and critical judgment is crucially involved in such creative achievement. In any creative solution to a problem, even the initial recognition that there is a problem to be solved, that there are phenomena in need of explanation or exploration involves critical evaluation. The recognition that a new direction or approach is required is an evaluation based on knowledge and an understanding of the problem situation. And there is critical judgment involved in determining the general range and form of possible solutions to problems or next moves in creating, the ideas and directions that might be fruitful, and even the ideas that will count as solutions or achieve the completion of a work.

Theories of creativity of the type I am discussing do sometimes allow a place for evaluation in creative production, but it is after the fact and quite distinct from the generative, creative phase. That is, one first suspends critical judgment in order to generate creative ideas, and then one may reinstitute judgment in order to evaluative these ideas. What I am contending is that one evaluates continually, and that indeed, one must. If evaluation were not involved in the very process of generating, then the results would not be creation but chaos. The process of brainstorming can provide an example since its express purpose is to generate ideas without evaluating them. Yet clearly the ideas which are generated are constrained by various criteria related to aspects of the problem situation. Not just any random ideas are generated, but only ideas related in some way to the problem. It is true that some criterion of judgment is suspended (for example practicality), but the majority of criteria still operate and constrain the very production of ideas.

Similarly, it can be shown that thinking which is primarily directed to the criticism and evaluation of ideas or products is not devoid of imagination. It is not merely analytic, selective and confined to frameworks but has imaginative, inventive, constructive aspects. Assessing information, arguments or actions on the basis of reasons is seldom a clear-cut or mechanical task, but requires an imaginative contribution on the part of the assessor. Even in the case of assessing individual arguments according to the criteria of informal logic, the procedure is not merely technical or algorithmic. Identifying assumptions, inventing hypotheses, generating counter-examples and constructing counter-arguments are all examples of critical thinking which require imagination. Scriven sums up this point well when he states, "the very process of criticism necessarily involves the creative activity of generating new theories or hypotheses to explain phenomena that have seemed to other people to admit of only one explanation." [3]

Contemporary conceptions of critical thinking do allow room for this imaginative dimension. Some older conceptions, for example Ennis's 1962 definition 'the correct assessing of statements', took a very narrow conception which stressed exclusively evaluative thinking. But Ennis's latest definition, 'reasonable, reflective thinking aimed at deciding what to believe or do,' or Siegel's 'being appropriately moved by reasons' are much broader conceptions. And the type of thinking characterized by these conceptions clearly has generative as well as evaluative dimensions. Critical thinking in this sense involves more than assessing isolated arguments, actions or pieces of information according to clearly defined criteria and using specifiable techniques, as Paul has pointed out. In actual instances of critical reasoning, it is rarely the case that we pass definitive judgment on isolated arguments. Rather, we judge between conflicting points of view, and adjudicate among competing arguments. And certainly the criteria of informal logic provide one basis for so doing. Yet such criteria are seldom decisive in and of themselves, and what the reasoner must do is to construct a new view which resolves the problems posed by the conflicting views and synthesizes the soundest aspects of each into a new and coherent whole. This dialectical aspect of critical thinking clearly requires imagination and invention.

This generative aspect to critical thought is also evident in thinking within traditional subject areas. Making assessments and solving problems within traditional disciplines are seldom automatic procedures. Rather, the reasoner must go beyond the confines of the given information, supplying imaginative constructs.

Thus it can be seen that the dichotomy between critical thinking and creative thinking is ill-founded. There is not one type of thinking which is strictly generative and leads to creative production and another type which is strictly evaluative and deals with the assessment of ideas and products. It might be best to think in terms of good thinking, which has both generative and evaluative dimensions. Specific tasks or problems may require more emphasis on one or the other aspect, for example designing a better mousetrap may require stress on the generative while determining the efficacy of someone else's new design may require more emphasis on the evaluative. Nonetheless, both these tasks have both generative and evaluative dimensions. Indeed, in all instances in which serious thinking is required, both the constraints of logic and the inventiveness of imagination come into play. There is some degree of creativity evident in all critical thinking, and in some cases, deliberations over what to reasonably believe or do lead one to question presuppositions or break rules -- and issue in products which display considerable novelty. This is not connected with irrational leaps, but rather with a broad and in-depth understanding of the problem situation and with attempts to solve these problems in ever better ways.

With this in mind, let us return to the saga of the bear and the two students. The standard view analysis would have us believe that student B was unable to solve the problem creatively because he was thinking critically. He analysed and evaluated information given the obvious definition of the problem situation, but his critical thinking could not lead him to a redefinition of the problem. For this a creative leap was required, of the type taken by student A. But I would want to claim that student A was thinking critically, and doing a good job of it. She was able to question assumptions, to envision consequences of various courses of action, and accurately to characterize the real nature of the problem. These are all aspects of good critical thinking.

ii) The fixed framework view

The underlying reason for this dichotomized view of thinking into the critical and the creative is what I shall call the fixed framework conception of knowledge. If critical thinking did take place within rigidly bounded and highly rule-governed frameworks, and if, within these frameworks, all necessary information were given, then the mode of thinking required would be strictly analytic and evaluative. Given this picture of frameworks, it would seem to follow that a radically different type of thinking would be required to transcend frameworks, a type of thinking which suspends the criteria of judgment of the framework, which breaks the rules, which makes irrational leaps, and which generates novelty.

One striking example of this fixed framework view is Kuhn's notion of paradigms and the related distinction between normal science and revolutionary science. According to Kuhn, normal science describes ordinary scientific practice, that activity which takes place according to a fixed paradigm or framework which specifies the problems to be undertaken and the procedures and standards to be used in investigating these problems. Such normal scientific practice is highly rule-bound, uncritical of the assumptions of the paradigm and essentially unoriginal. Revolutionary science, on the other hand, is characterized by a radical departure from the prevailing paradigm involving the overthrow of the presuppositions underlying the old paradigm and the creation of a radically new framework. This new paradigm is not simply a logical continuation of the previous one, but involves a radically new way of viewing phenomena and is thus discontinuous with the previously accepted theories in the area. Thus the postulation and acceptance of a new paradigm cannot be achieved by application of rules and standards of the previous paradigm, but is characterized by a non-rational conversion or gestalt switch.

The popularity of Kuhn's view, which extends far beyond the realm of science, attests to the hold of the fixed framework view on the popular consciousness. Nevertheless, this view of how frameworks operate is radically defective. There are relatively few cases in which we operate within clear-cut, clearly determined and rigidly bounded frameworks. In most situations which require critical thought, frameworks overlap, shift, and have indefinite boundaries.

Moreover, the fixed framework view rests on the notion that created works involve a radical break with the past and a discontinuity with the preceding tradition, but this view cannot hold up under scrutiny. If we take as an example Kuhn's version of the thesis, then it can be shown that his distinction between revolutionary science and normal science is much too strong. Numerous historians and philosophers of science have demonstrated that even scientific discoveries of an apparently revolutionary kind have their roots in the problems and the paradigms of previous theories. They have shown that there are continuities between successive theories, and that scientific development is more gradual that the Kuhnian model suggests.[4] What is more, this sort of continuity is apparent in creations in all fields. Indeed, this must be the case, since innovations can only be understood and can only gain significance in light of such traditions. If this is the case, then there is no reason to posit a non-rational, non-evaluative kind of thinking which breaks all the rules in order to transcend a framework. Rather, effective innovation can be accounted for in terms of critical thinking, broadly conceived, i.e. good thinking, thinking which is reasonable and reflective, thinking which has both a generative and an evaluative component. And the procedures and standards for such thinking are largely built into our traditional disciplines.

Thus the preceding discussion has important implications for how we conceive of the disciplines. Much traditional teaching has given the impression that disciplines are simply static and rigid bodies of information. Traditionally, what has been taught in the various subject areas has been the products of past thought. History has involved learning the "facts" of what happened in the past, mathematics has involved mastering the procedures for arriving at the "right" answers, science has involved the assimilation of the "truth" about the physical world (a rhetoric of conclusions, to use Schwab's phrase). Implicit in this teaching is the belief that knowledge is certain, fixed and takes place within determined, and rigidly bounded frameworks. A discipline, then, is seen as a collection of information and procedures which is bound within a framework and is static and fixed. Knowledge consists in the information we possess plus procedures for manipulating this information within the specified frameworks. Thus traditional teaching has reflected the fixed framework view. This conception of disciplines is radically defective, however. Disciplines are not static and rigid bodies of information. Rather, they are open-ended and dynamic. They are not merely collections of data, but are modes of inquiry containing unresolved problems, active debates and areas of controversy. They contain open question and modes of investigating these questions and of evaluating the solutions. And even the body of knowledge is not fixed but is in flux. But change in this body of beliefs does not occur arbitrarily; it occurs, rather, as a result of the critical procedures and standards which embody the process of inquiry. Mechanisms for criticism and thereby for evolution are built right into the disciplines themselves. Thus the possibility for evolution and innovation is afforded by the critical and dynamic nature of disciplines and does not require an abandonment of critical thought or disciplinary skills nor a reliance on non-rational processes. Critical thinking in the disciplines is really a form of creative inquiry.

Conceptions of Critical Thinking

What are the implications of this view for how we conceptualize critical thinking? The proponents of the most widely accepted theories of critical thinking (eg. Ennis, Siegel) would not accept the fixed framework picture of knowledge. According to their theories, critical thinking involves the critical examination of views and their assumptions and the adoption of new views when warranted by evidence and good reasons. Theirs are views which see knowledge as evolving through the process of inquiry and are, thus, entirely compatible with creativity. Nonetheless, this picture of knowledge as evolving which is implicit in views of critical thinking is seldom made explicit, and this can lead to misunderstandings about the nature of critical thinking and its relationship to creativity. For example, one criticism which has been levelled against the standard view of critical thinking (exemplified by Ennis and Siegel) is that it demands reasonableness and this requirement of reasonableness will tie one to accepted ideas and thus stifle creativity.[5] To quote Missimer, "The tension between critical thinking and mental creativity or imagination is well known. It is not hard to see how this tension exists if one accepts the strictures of reasonableness and appropriateness placed by the Individual [standard] View. The Individual View works against theoretical innovation, since what is new is often thought odd or unreasonable."

This type of criticism rests, I think, on the fixed framework view. If what is reasonable is defined by the accepted views in the prevailing framework, then reasonableness will indeed keep one locked into the prevailing framework and will stifle creativity. and what would be required in order to transcend frameworks and create new knowledge would be unreasonableness. But 'reasonable', for these critical thinking theories, does not mean 'according to accepted ideas', but rather 'according to the rules of logic and the standards of assessment of the discipline'. And what is reasonable consists sometimes in rejecting accepted ideas. Thus this type of criticism fails to recognize that these views of critical thinking presuppose a conception of knowledge as evolving and not the fixed framework view. Critical thinking involves more than the manipulation of elements within a framework. It involves coming up with a new view which is one's own. This will frequently involve the rejection of some accepted ideas, and sometimes it will involve the rejection of some fairly fundamental presuppositions and will issue in products which display considerable novelty. Thus new knowledge is developed, and it is the principles and procedures according to which belief and actions are assessed which allow for this development.

While this idea that critical thinking is inhibiting to creativity is mistaken, it is perhaps not surprising that this type of view is so prevalent. Current conceptions of critical thinking tend not to be explicit about the picture of knowledge upon which they rest. They tend not to counter explicitly the fixed framework view nor do they, in general, emphasize the creative nature of inquiry. I am pleased to note that both Ennis and Siegel have recently begun to acknowledge the connection between critical thinking and creative thinking. Ennis makes the point, for example, that his "current definition includes creative elements"[6]; and Siegel states that "nothing about the reasons conception of critical thinking forces a sharp split between critical and creative thinking, or the view that creativity, properly conceived, is not part of the repertoire of the critical thinker."[7] These comments are made parenthetically or in passing, however. I think that it is important that this relationship be made explicit and more central.

Moreover, current conceptions of critical thinking tend to view critical thinking in terms of a combination of skills and dispositions. And while this type of analysis is very useful and enlightening, it is perhaps limited in failing to deal with the way we think about disciplines. One prevalent approach to addressing the issue of critical thinking in the disciplines is the infusion approach, i.e. infusing critical thinking skills into subject area instruction. But I believe that there is something misleading about the notion of infusion. It seems to imply that there are two distinct elements, critical thinking skills and disciplinary subject matter, and that what is necessary is to inject some of the former into the latter. But critical thinking is not something to be added on to disciplinary knowledge. Rather, criticism is built right into the principles and procedures of disciplines.

Perhaps, then, the additional element which is required in our conception of critical thinking in addition to skills and dispositions is a certain type of understanding. It is an understanding of how knowledge is made, developed and advanced. And it is an understanding of the nature and role of the disciplines as forms of inquiry in developing knowledge. It must be understood that disciplines are not fixed bodies of information to be assimilated. And certainly those interested in fostering critical thinking have focussed on countering the practice of education as the mere assimilation of information. But what is also required is an understanding that critical thinking does not take place within fixed frameworks or paradigms with all problems and methods prescribed. Critical thinking does not involve merely techniques which allow one to assess information within the confines of the prevailing framework. Rather, the critical principles and procedures of disciplines allow for constant examination of current beliefs and theories and the generation of new views which better solve the problems and resolve the deep issues in the area.

Educational Implications

What precisely does this analysis mean for education and our manner of teaching? I am suggesting that we must explicitly address the nature of knowledge and of disciplinary inquiry in our teaching. We must teach disciplines as critical and creative. And by this I want to say more than that disciplines are useful instruments for the teaching of critical and creative thinking and that thinking is best taught within them. I am claiming that not teaching disciplines as both critical and creative gives a false sense of the nature of disciplines and of critical and creative thinking, and these false pictures present barriers when one attempts to introduce critical thinking. Teaching critical thinking without a complementary understanding of how knowledge changes may lead students to a faulty notion of what critical thinking is. They may come to see it as strictly evaluative and fail to recognize its creative aspect. And it may be that our teaching of critical thinking tends to exacerbate this by overemphasizing the aspect of assessment without sufficient attention given to the creative dimension. Critical thinking is, after all, more than simply assessing isolated arguments. It necessitates deciding among opposing views and this involves questioning assumptions, discarding beliefs, and coming up with a new view which is one's own. One creates a view, but guided by critical standards. And this is not very different from what goes on in more prototypical instances of creativity such as the development of a new scientific theory. Perhaps, then, it would be helpful in critical thinking instruction to put considerable emphasis on questioning assumptions, considering alternatives, constructing arguments, and developing an independent line of reasoning.

Nonetheless it seems to me that the main job is to be done in the area of subject matter instruction, and here it is imperative that the true nature of disciplinary knowledge be conveyed. Students must get a sense that a discipline is not just a static collection of information and techniques for manipulating this information within the set framework. It is a mode of inquiry which contains open questions, areas of controversy and ongoing debates. Students must master not only the current body of information but also the principles and procedures of the discipline, the methods whereby inquiry proceeds, the standards according to which reasons are assessed, and the deep questions which are at issue. Criticism must be understood as part of the subject matter itself, as part of what it means to learn a discipline, as the method whereby inquiry proceeds. And we must convey a sense that the possibility for evolution and innovation is afforded by the critical and dynamic nature of disciplines and does not require an abandonment of disciplinary skills nor a reliance on irrational processes.

This mode of proceeding does not imply that one ought to neglect disciplinary knowledge and skills in favour of critical thinking skills. It is essential that the currently accepted information in an area be learned. But teaching a discipline only as information is vastly incomplete; and not giving students a sense that this information is only the current product of our modes of inquiry is misleading. But it is also misleading to fail to convey the idea that there are standards and procedures which govern the manner in which this information changes and evolves. It is important to teach this information in a manner that gives the students a sense that the knowledge we are conveying arises in response to questions, that it is the best we have at the moment but is not totally uncontroversial, that there have been changes in what we considered as knowledge in the past, and that this will likely change again. But we must also convey the idea that these changes take place according to rules, criteria, standards and principles, and we must also pass on the substance of these to our students.

If our teaching within the disciplines fails to accomplish this, then there is a danger of entrenching a faulty picture of knowledge which may be extremely difficult to counter. The fixed framework view and the opposition between critical and creative thinking which goes along with it can give rise to a sense that there are only two possible approaches to knowledge. Either one can be critical, which involves getting to the right answer through a series of prescribed techniques. Or one can be creative, which involves thinking divergently, relying on subjective personal opinion, and ignoring critical criteria for assessment. I think that students are often genuinely puzzled by what we want of them when we ask them to think critically because they have a very distorted picture of the nature of knowledge and of inquiry. What we face, when we attempt to teach critical thinking, is not just a lack of skills or dispositions, but a real lack of understanding of the whole nature of the enterprise in which we wish them to engage. Teaching the disciplines as modes of creative inquiry may provide students with a sounder conception of knowledge in which to ground critical thinking.

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Critical Thinking Across the Disciplines

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The conference, "Critical Thinking: Language and Inquiry in the Disciplines," has been characterized by a paragraph included in all of the conference mailings: "Critical thinking in the disciplines requires mastery of the forms of inquiry. Embedded in language, such forms yield the tools for inventing, organizing and communicating the content of the various areas of human concern." The paragraph raises a number of questions, particularly, the relation of critical thinking to inquiry and the role of language as the ground into which inquiry is embedded.

As is by now well known, the Institute for Critical Thinking takes critical thinking to include the reasonable, self-reflective and context-sensitive use of criteria. Critical inquiry thus requires the identification and reasonable application of criteria appropriate to the context of inquiry. But where are these criteria to be found and how is the notion of critical inquiry related to the language in which it is embedded? It should not be surprising, given the title of this piece, that the answer to these questions should be found in the particular role that the disciplines play as a crucial context for inquiry. To see this, it is necessary to explore the relation between the disciplines as the locus of inquiry and the languages within which inquiry takes place.

The language of the disciplines

Language as related to the disciplines can be seen as involving "language" in three senses. The first two are general; the last addresses the disciplines in their relation to undergraduate education. The three senses of "language" are as follows:

1. Language as a "language game" in the sense of Wittgenstein. Expressive of a "form of life," language includes a set of *paradigmatic practices* that underlie the particular concepts and argument types characteristic of a discipline. Language as "language game" relates the overt language in use to the lived reality of practitioners of the discipline and draws from the historical experience that gives each discipline its characteristic profile.

2. Language as a specific set of concepts and argument prototypes: particular vocabulary and characteristic modes of organizing disciplinary content.

3. Language as a set of basic competencies required of students and assessed through tasks deemed necessary if students are to understand the discipline and the information and procedures that it includes.

Such a schematic representation remains opaque without a few telling examples. Perhaps the following will offer some sense of how the specifics of various disciplines point to the need for a careful look at the particulars of disiplinary inquiry as related to the three aspects of language presented.

Language as the expression of a "form of life"

To take an example: Philosophy, a central paradigm, shows a marked discontinuity with an analogue in Chemistry. Philosophers take the practice epitomized by Socrates as a basic model for inquiry. That is, the practice of doing Philosophy includes at its core careful and pointed questioning, whose purpose is to elicit and clarify concepts that are thought to be already available to the philosophical thinker either as intuitive knowledge or perhaps as the result of the internalization of conceptual frameworks and linguistic structures. It is evident from such practice that philosophers maintain that basic philosophical concepts are available to reflection and can be clarified through dialectic.

Chemists, on the other hand, base their paradigm on the procedures of classic chemists such as Laviosier and Dalton. These procedures are quite specific, weighing, heating and combining in simple proportions, and are a small sub-set of the possible procedures that could be applied to material substances. The success of these initial methods of inquiry leads chemists to look to analogous procedures and reflects their assumption that complex chemical phenomena are explained when shown to be the result of analogues of these primordial practices (analysis in terms of mass, measurement of electrical resistence and the like).

Language as concepts and arguments

Language in this sense offers an even clearer image of the differences that characterize inquiry in the disciplines. Each discipline includes both a set of concepts and a logic-- a set of tacit or explicit rules governing how discourse is to be organized for presentation, challenge and defense. In Classical Economics, for example, typical concepts include *value*, *exchange* and *market*. Their variants pervade Economics as a discipline and importantly define a prototypical argument type: the explanation of economic behavior in terms of subjective preferences and descriptions of market force deemed relatively objective and describable in quantitative terms.

A far removed example of similar structure is the analysis of harmony in Music in terms of Dominant and Tonic. Both musical analysis and composition reflect this in proto-typical dominant-tonic relations, these include harmonic substitutions (*C#min7*, *F#7* in *G major*) and large formal analogues (the *Sonata-Allegro* principle).

Language as a set of student competencies

This involves the set of student skills required in the disciplines and helps to specify student tasks and grounds the assessment of student achievement. Analogous to reading and writing, such skills are grouped around information gathering and information use. These vary in obvious ways: understanding and producing laboratory reports in Physics and reading and writing short stories in English. There are more subtle distinctions as well. Take as an example the contrast between analyzing a classic philosophical text to draw out its main points and writing an analytic essay showing where crucial philosophical difficulites lie, on the one hand, as compared to reading original documents to develop a sense of an historical period, and using documents to argue for a particular perspective or interpretation of an era, on the other.

The current conception of critical thinking

Given the apparent disciplinary specificity of the languages as presented above, the obvious question is: Is critical thinking, as currently conceived, sufficient to engender critical thinkers in particular fields and at various educational levels?

The key term in the question as stated is "sufficient." The central requirement is an adequate analysis of critical thinking as currently conceived. We look first for a notion of critical thinking that adequately reflects central aspects of the current conception and then deal with the complex of issues relevant to the concept of sufficiency. Critical thinking is an amorphous concept. But like many amorphous concepts some clarity can be obtained by looking at the concept in use. Among critical thinking theorists, those academicians who have chosen to identify themselves through publication and teaching with the developing field, a common focus is on courses in critical thinking that purport to offer students general and subject neutral strategies for, in Robert Ennis' often quoted phrase, "reasonable reflective thinking that is focused on deciding what to believe or do" ("A Taxonomy of Critical Thinking Skills and Disposition," in J. B. Baron and R.J. Sternberg (Eds.), *Teaching Thinking Skills*. New York: W.H. Freeman and Company, 1987). Ennis' compendium of critical thinking dispositions and abilities reflects a common core of epistemological concepts, logical skills and student traits reflected in the enormous and ever-expanding list of text-books relevant to critical thinking.

The textbooks in the field point to a domain of application for the abilities and dispositions developed through their use. The majority of available texts draw material from the popular press, from media and from political positions. Less frequently material is drawn from student level texts, especially philosophy, but these are never systematically explored. Rather text materials are abstracted and presented within a format that addresses the skill or concept under discussion. Short fragments whether newspaper editorials or a section of an undergraduate history text (usually outdated) do little to represent argument in a discipline, rather it presents for the student small segments of reasoned discourse whose function is to offer the occasion for the application of a given particular critical thinking concept. The impression garnered from texts is reinforced by the statement of advocates of critical thinking. The claim is that critical thinking is generally applicable and subject neutral, This has been most apparent in the responses of members of the informal logic community to John McPeck's challenge in *Critical Thinking and Education*, (New York: St. Martin's Press, 1981). McPeck faulted the movement on the grounds that general and subject neutral critical thinking was vacuous. Critical thinking, he argued, required a subject domain for its appropriate application, and varied in accordance with the methodological principles that characterized inquiry in the various areas of knowledge. Rather than rejecting subject neutrality as an essential characteristic of critical thinking, informal logic theorists offered arguments for the relevance of subject neutral skills to the objectives for which critical thinking instruction was envisioned. Richard Paul argued in response that discipline neutrality is essential since the most important problems for which critical thinking is required are not resolvable within the academic disciplines since the most crucial domain of application for critical thought is problems that are "multi-logical" and "dialogical," problems that are inimical to discipline specific perspectives and training ("A Review of *Critical Thinking and Education* by John E. McPeck, in *Informal Logic*, Spring, 1986). This echoed a common theme in reviews of McPeck written by informal logicians, reflecting a position that had been voiced throughout the history of the movement: critical thinking is a generalizable set of skills applicable to the complex and frequently ill-structured problems of daily life.

These brief indicators support the view that the current conception of critical thinking is tied to the claim that there exists a definable set of general and subject neutral skills and attitudes that are relevant to broad social and political issues. The next task is to relate this conception to a notion of critical thinking adequate to college learning. In order to do this some discussion of objectives appropriate to college education is required. This is of special concern given the suggestion above that knowledge in the fields that make up the subject areas in college education vary in the language they use in the complex sense developed above. Since, as the analysis suggests the language of the disciplines is varied and relevant to argumentation in the fields.

Before we continue, it should be immediately conceded that much of what is included in the common conception of critical thinking is general, discipline neutral and relevant to aspects of instruction in a variety of college courses. But are those aspects, conceived as general and topic neutral, adequate to educational objectives appropriate to undergraduate education?

A number of critical thinking theorists have offered analyses of the educational objectives for which critical thinking is to be developed. Many of these are extremely general, relating to the development of rational persons or well-functioning and reasonable citizens. Others have taken as their goal persons aware of their own biases, and the social interests that qualify their relation to reasons offered by themselves and others. Other theorists have had more specific concerns: the developing of problem solving or decision making ability, the enhancement of a philosophical temperament or a disposition to sustain appropriately sceptical attitudes. Although all of these are important and complementary objectives, none of these address the issues that, for me, are at the core of critical thinking within the context of post-secondary education. Critical thinking at the college level has very specific objectives, objectives that are intrinsically related to the range of ends for which college education is required. To speak of the sufficiency of a model of critical thinking in colleges, thus, requires an analysis of what in critical thinking addresses the goals that are most appropriate to college education.

Of the many authors who have spoken to the issue, Harvey Siegel in *Educating Reason* (London: Routledge, 1988) offers an analysis that seems both relevant and defensible. Siegel has argued that, among other things, the goal of critical thinking is to introduce students to the "rational traditions." Siegel sees McPeck as offering a substantive recommendation in his insistence that critical thinking pay attention to the "epistemology of the disciplines;" that is, critical thinking should include in its purview the standards that govern "good reasons" in disciplinary efforts to substantiate claims in their field. The conception of knowledge in the fields does not sit comfortably with some perspectives in the informal logic movement, especially a position such as Paul's that sees disciplinary thinking as artificial and too narrow to address multi-logical and ethical issues. Nevertheless, even if social and political concerns transcend narrow disciplinary foci it is plausible that information from the fields may be relevant to the amalgum of information necessary to address cross-disciplinary concerns. How can a student be helped to evaluate and apply information from a variety of fields in responding in an informed fashion to multi-logical issues? How can students be helped to critically assess information within the subjects they are required to master and how can they be helped to apply such knowledge to the rich multi-dimensional issues that characterize social and political issues and decisions in everyday life? If critical thinking as commonly understood is offered in response to such questions, the following can serve as a focus for the discussion of sufficiency. In particular, is critical thinking as currently understood adequate to the following educational objective:

> **To help students develop and apply critical thinking skills and dispositions to the various areas of college study and to transfer such competencies to problems that cross disciplines and especially to complex problems in the "real world."**

This raises a number of specific questions that define a research agenda for critical thinking conceived as relevant across the disciplines and at the undergraduate level. Do the procedures neutrally characterized by critical thinking theorists retain sufficient continuity when translated into the languages in use in the various fields? Do they retain significant similarity when instantiated in the various procedures that govern inquiry in the domains of knowledge?

These are not trivial questions. They have been a concern of critical thinking theorists for almost a decade. But they have been universally addressed on a level of generality and philosophical argument that seems to me ineffective for their clarification and resolution. I maintain that an adequate response to the issues such questions reflect, requires careful analyses of the particulars of the various disciplines. The brief analysis of the diversity of the languages of the discipline offered above points to a framework of argument that is relevant to the dispute. For if the various disciplines are embedded in relevantly dissimilar practices and if these practices support and require argument structures and epistemological norms that are substantive, in the sense that good reasons are warranted through them, then the claim to significant generality and subject neutrality is weakened.

The consequences of such an argument are crucial to the relevance of critical thinking across the disciplines. For if the argument is sound, critical thinking across the disciplines will only become a reality when the normative function, heretofore reserved for philosophers, shifts to include the realities of concepts and practices that warrant the central role the disciplines play in furnishing much of what is worth knowing about the world around us.

The notion of sufficiency calls to mind its analogue: necessity. Is there some core to the notion of critical thinking as currently conceived that is a necessary aspect of education in the various fields, given the ends for which critical thinkng is envisioned? Here too, the question requires careful analysis of actual practice. For even if there is some definable core, necessary for thoughtful practitioners in the various fields, does this core require a common set of educational strategies to be included in schooling in the various domains? Or are the particulars of disciplinary study sufficient to engender critical thinking skills and dispositions without a systematic focus on the skills and dispositions themselves?

These crucial questions require a response from critical thinking theorists concerned with undergraduate education across the disciplines. As mentioned earlier, it is my conviction that working towards an appropriate response requires a research agenda that is more concerned with actual disciplinary practice and less with abstract epistemological or logical arguments. In this I see continuity with the tendency that motivated the movement from formal logic to informal logic or the shift from abstract, frequently formal philosophy of science to the analysis of case studies drawn from the history of science. These tendencies raise profound epistemological questions as to the locus of epistemic widsom. It is my sense that, increasingly, insights into epistemological adequacy must be drawn from successful practice and be couched in terms that reflect the complexity and sophistication of actual argument. That is my intuition; a defense of this intuition rests on the task successfully accomplished and wisdom gained. My intuition is based on the analysis of language offered above. It is reinforced by my sense that critical thinking skills, generally characterized, gives the form of the concerns but none of the necessary substance, if the result of critical thinking is to be the ability to assess good reasons in various fields. But that is to repeat my conviction rather than to support it. Support must wait upon the careful analysis of critical thinking skills as instantiated in the various domains. But even at the level of these programmatic remarks there is more to the issue of the sufficiency of critical thinking as commonly understood to the notion of critical thinking across the disciplines and at the college level.

Critical thinking and educational reform

The impact of the movement as a practical vehicle for educational reform raises additional considerations as well. Critical thinking theorists see their work as relevant to the reform of actual educational institutions. I claim that if critical thinking is to be effective as a vehicle for reform the issues raised must be seen within three "dimensions." The relevance of the current conception of critical thinking skills and dispositions must be understood within three essential contexts:

1. the theoretical context of the various disciplines,
2. the pedagogical practices appropriate to education in the fields,
3. the pragmatic context generated by over-arching institutional concerns.

The theoretical context

Even if it is ultimately seen that critical thinking is generally available and neutral in respect of the methodological standards in particular disciplines, it is not apparently so once the relevance and diversity of disciplinary languages is acknowledged. Critical thinking and the epistemological and logical criteria that are espoused in its name are not obviously identical with or readily translated into correlative principles in the various fields. The former is warranted on its face; the latter is supported by reflection upon the last fifty years in philosophy of science. The attempts of philosophers of science to come up with general analyses of scientific practice that are both logically based and descriptively adequate has been seen as unsatisfactory to philosophers themselves. Both within and among the disciplines, faithfulness to scientific practice points up the inadequacy of the available general accounts of scientific method, of causation, of induction, and of the nature and role of observation

But there is more to the problem, for the judgment of philosophers is not the only relevant judgment if critical thinking is to reach across the disciplines. Scholars, researchers and teachers in all of the fields to be touched by critical thinking must themselves see the relevance of any given account of critical thinking to their efforts. And given the concern with educational reform, an acount of critical thinking offered as relevant to disciplinary issues must be appropriate and effective in teaching as well.

The pedagogical context

Critical thinking theorists have questioned pedagogical practices that are common throughout undergraduate education. The use of lecture, didactic teaching, objective examinations and grading are all brought into question by critical thinking advocates who see dialogical and multi-logical pedagogy at the core of critical thinking instruction. This becomes an issue for any discipline whose practice supports didactic models as most appropriate for instruction in the field. The epistemological basis of critical thinking has barely been explored; its relation to theories of learning is nowhere near resolved. Current pedagogical practices, on the other hand, are supported by tradition and practice and have been addressed in a systematic way by educational psychologists and specialists in teaching. Although the critical thinking movement is not without plausible pedagogical recommendations and a growing body of successful educational practice, paradigms for critical thinking instruction have been drawn from particular subject areas. It is just not obviously the case that Socratic discussion, so at home in the philosophy class, is equally pertinant to teaching calculus, or that group problem solving strategies are relevant to literature or writing process approaches to sociology. Clearly what is needed is further exploration, open mindedness and careful analysis. That is wherever else critical thinking is required, critical thinking about critical thinking is of paramount necessity.

The institutional context

Although frequently disregarded as "political," institutional issues must be dealt with as well. The education of undergraduates takes place in a holistic context. The various elements included in the curriculum are required to amplify each other, enabling the student to achieve his or her professional goals while responding to the more idealistic aims of humanistic education and the liberal arts tradition. The relation of critical thinking to the complex of interlocking course requirements and professional accreditation must be taken into account if critical thinking reform is to be effective in college as a whole. Critical thinking across the disciplines requires a careful effort to educate faculty in the particulars of the field and to the desirability of critical thinking outcomes. This, more likely than not, requires a complex and long-term program in faculty development. Issues of the autonomy of the disciplines, of research vs. teaching and of institutional and disciplinary reward structures are confounding variables in any program of institutional reform in the name of critical thinking. Student expectations, patterns of assessment and the demands of particular fields of study are all serious roadblocks to meaningful institutional change. And all of these must be resolved within the complex of personalities and politics that characterize colleges.

The concerns that each dimension contributes cannot be overlooked if critical thinking across the disciplines is to become a reality. For those of us who see critical thinking as more than a particular course, as more than the perspective of a particular discipline, critical thinking must be seen within the total institutional context, within the realities of teaching and within the perspective of disciplinary practice *if critical thinking is to be effective at all.*

Critical thinking across the disciplines

These issues persist as a concern for many advocates of disciplinary knowledge, despite the arguments that attempt to show relevant and useful notions of critical thinking that are generally available for instruction and neutral in respect of the disciplines. The resolution of these issues requires that reflective practitioners of the disciplines, students of the history of ideas, methodologists and specialists in teaching increasingly engage in the task of generating and organizing the data upon which an informed and adequate notion of critical thinking across the disciplines must be based.

My own research responds to such an agenda. Increasingly, my interest involves working with colleagues from a variety of disciplines attemping to analyize and contrast methods in the various fields, what has been called by McPeck and others, the "epistemology of the disciplines." If the locus of critical thinking is to be found in the particulars of disciplinary language and modes of inquiry, then critical thinking, at the undergraduate level at least, will require a focus different from the common concern with topic neutral skills and dispositions. At Montclair State some of us are attempting to grapple with the reformulation of the focus of critical thinking through the study of the disciplines in an "ecological perspective." This requires a systematic exploration of the continuities and differences in language and inquiry across the various fields; the relation of particular disciplines to multi-field concerns, and the application of disciplinary knowledge to broad, "real world" problems.

The ecology of the disciplines develops a stance in relation to the issue of multi-logical issues. We accept the fact that methods within the disciplines are frequently inadequate to problems that transcend narrow disciplinary frames. But we insist that information drawn from within these frames is necessary if the multi-logical problems are to be addressed in an informed and responsible fashion. Further, we maintain that information from the fields includes *substantive methodological principles,* principles of epistemological and logical relevance that are drawn from the practice of the disciplines and that are not available in the general characterizations of methodology developed by philosophers working in abstraction from practice. The ecology of the disciplines also includes the perspective that sees methodological insight to be garnered from the comparison of methodological principles in the various disciplines. This requires the detailed description and assessment of disciplinary practice from the perspective of diverse disciplines. Such a cross-disciplinary perspective certainly includes methodology drawn from the work of philosophers, but philosophy is not uniquely relevant to this study. Philosophers work in specific ways, perhaps in ways that are useful as contrasting points of methodological perspective, but so do sociologists, art historians and chemists. There is no *a priori* argument that I accept that substantiates the claims of any discipline to methodological priority.

Harvey Siegel has offered such an argument, claiming, in effect, that if such inter-disciplinary contrasts are to be reasonable they must be based on good reasons, these latter being defined as epistemological in the general philosophical sense. Clearly Siegel is correct in maintaining that inter-disciplinary assessments must be based on good reasons, but it is equally clear that there is no reason to suppose that such standards for assessment must be drawn from philosophical epistemology whether as currently understood or as understood by some future heir of the contemporary philosophical tradition. For, contrary to Siegel, I maintain that it remains to be seen whose methodologcial practice is best suited to constitute the forum within which cross-disciplinary assesssments are to be made. Historically, philosophers, being concerned with the most abstract principles of inquiry, have played the role -- frequently self-appointed -- of court of last resort in methodological disputes. Certainly, the practice of assessing methodology at the highest level of abstraction can be *called* philosophy with historical and philological warrant. But that is not the issue. The issue for me, is to identify the domain(s) from which the most adequate methodological concept set is to be drawn. Call the result philosophy if you will, the issue is still from whose practice is epistemological warrant to be drawn. Is the *a priori* practice of philosophers to be the model, or is it rather the axiomatic practice of mathematicians? Is it, perhaps, the theory bound practice of modern physics or rather the inductivist strategies common in the social sciences?

The preceeding remarks offer an argument scheme applicable to the vast majority of critical thinking skills identified in lists such as Ennis'. So, for example, whose notion of causality is most relevant to critical thinking, the historians', the literary critics', the quantum physicists' or the educational psychologists'? Or is it rather some philosophers' and, if so, which of those available in a rich and varied literature? Analyses of causation, judging from classic and contemporary philosophical texts, include a host of related but distinguishable notions. Looking at practices in the various disciplines increases the available models for understanding causality. To ask, as do some critical thinking theorists, that students be helped to adjudicate which of various causal claims is most adequate is to require that students be familiar with the various ways that causal claims are grounded in the various domains of inquiry. There just is no univocal analysis of causation that stands as the final court of appeal. The same is true of other central epistemological concepts. Who's notion of observation is most salient to a given multi-logical dispute: the art critics', the neuro-physiologists', the cognitive scientists' or the chemists'? What standards for authority are required: the sociologists', the political scientists' or the theologians'? Whose requirements of clarity should be sustained: the poets', the bio-chemists' or the geometers'? Such issues, I maintain, can only be joined by contrasting available concepts sets and looking to our epistemological purposes. The various domains of knowledge all have particular insights to offer. These domains include philosophy as a member. Philosophy does not, however, exhaust the available methodological insights, neither through its method nor through its concepts.

The focus I have been describing, an ecological perspective on the disciplines, shifts both the normative and descriptive core of critical thinking. The concern is less with the general concepts of informal logic and more with the concept maps that govern assessment of information in the fields. Most importantly, an ecological approach leaves open the possibility that abstract epistemological arguments drawn from the work of philosophers are not the court of last resort, that successful practice in the various disciplines has normative force, and that critical thinking must be closely tied to sound educational policies consistent with an adequate knowledge base in the various domains.

Such a focus has an additional yield in the institutional contexts within which we strive. It makes critical thinking across the disciplines a central concern of the entire educational community and affords an invitation to practitioners of all the area studies to join with philosophers in the epistemological enterprise. Most importantly, for educational reform, it offers a framework for the totality of college studies that requires synthesis and significance, flexibility and creativity. Such a framework can offer the real possibility of educational reform since it gives credence to the entire range of methodological alternatives, is open to the pedagogical demands of the various fields and welcomes all members of the college community as equal participants in the task at hand. If we admit to the relevance of higher education for the larger objectives for which the reasonable life is deemed best, such an approach equips our students for their lives as citizens, as decision makers and as rational persons, for it is no less than equipping our students with what seems best in the realm of reasons as the warrants for their judgments.

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Critical Thinking and Basic Theory

Critical thinking requires an account of how people reason, how they organize their thoughts and how they understand language. The two papers in this section offer analyses of basic concerns that raise serious issues in critical thinking theory. Woods offers an analysis of concept formation through categories that raises issues as to the fundamental grounds for our categories and their objectivity. Teschner and McClusky offer a theory of meaning that is equally radical in its implications for how people understand meaning and how meaning is related to evaluating claims.

David R. Woods in his paper *Implications for Communications of the Experientialist Theory of Categorization* examines some implications of recent "experientialist work on categorization within the field of communications." Woods addresses central issues in critical thinking when he examines the conceptual structures underlying categorizing. Categorization is fundamental to many critical thinking skills; it plays an essential role in comparison and contrast, supports sound inductions, and is presupposed in entailment and class logic. Woods presents the work of Lakoff and others claiming that such work "has challenged the long tradition of objectivist categories defined by necessary and sufficient conditions satisfied in objective, external reality." Lakoff's work, Woods states, "presents an alternative theory of categorization grounded in human experience." Woods maintains that "the experientialist theory opens up new ways of understanding conceptual and linguistic relativity at the same time that its biological grounding constrains that relativity."

The second paper in this section, *Reasoning and the Arbitrary Nature of the Sign*, by George Teschner and Frank B. McClusky continues the exploration of the basis of critical thinking in conceptual fundamentals by examining the notion of meaning itself. The paper addresses issues vital to critical thinking when it attempts to show "that for Saussure morphological, semantic and grammatical structures interpenetrate and are only separable in abstraction and that the same can be said for the logical forms that are investigated in argument analysis." The key to the claim is that meaning can only be seen by contrast, that "for Saussure the meaning of a word lies in the difference between it and its synonyms and it is this difference that generates the sequential formations." This has consequences for the analysis and evaluation of arguments that points in directions yet unexplored by critical thinking theorists.

Implications of the Experientialist Theory of Categorization for Communications

David R. Woods

Abstract

This paper examines some implications of recent "experientialist" work on categorization within the field of communications, especially for the understanding of difficulties in interpersonal communication. The work of Lakoff 1987 and others has challenged the long tradition of objectivist categories defined by necessary and sufficient conditions satisfied in objective, external reality. Lakoff's work presents an alternative theory of categorization grounded in human experience. This experientialist theory opens up new ways of understanding conceptual and linguistic relativity at the same time that its biological grounding constrains that relativity. Whereas past theories of relativity attributed conceptual differences to differences in the way languages "carved up" external, objective reality, experientialist theory stresses the characteristic way that humans transform their experiences into a multitude of realities. This paper will discuss examples of the application of experientialist theory to problems of interpersonal and intercultural communication. In particular, it will focus on the covert role of the cognitive models (ICMs) which structure knowledge and which are presupposed by speakers and listeners in communication. It is speculated that communicating across disciplines may be analogous to intercultural communication.

I. Introduction

> *Embedded in language, [the] forms [of critical thinking] yield the tools for inventing, organizing, and communicating the content of the various areas of human concern. (From the Conference Program)*

The theme of this conference focuses on the relation of language to critical thought. The quotation above from the conference program asserts that embedded within the forms of language are the tools for inventing, organizing, and communicating what we talk about in our various disciplines. Language is not a passive vehicle for transmitting ideas but rather plays an active role in the creation and organization of the thoughts of both speaker and listener. Both speaker and listener share responsibility for the success of communication (Verderber 1987: 5). As a consequence, if we are to understand communications among ourselves, we should be conscious of how language gives structure to thought.

The purpose of this paper is to relate recent literature on the so-called "experientialist" theory of categorization to examples of intercultural communication. First, following Langer, the paper asserts that all human experience is transformed symbolically, that is, that it is not simply a mirror of an objective reality. Second, following Lakoff and Johnson, the symbolic transformation is seen as having biological roots in the peculiar ways that human cognition shapes our experience. In this section, categories are seen to be in hierarchical relations with one intermediate level having certain basic properties, built around a representative "image" or prototype of the category; and categories are seen to be interrelated in idealized cognitive models such as stereotypes. Cognitive models have characteristic structuring principles such as propositional structure or metaphorical structure. Third, still following Lakoff, the paper shows how these aspects of cognitive structure lead to a kind of relativity in conceptualization that may underlie many examples of failed communication. It is not unconstrained subjectivism but it cannot be ignored as a source of difficulty in our efforts to share our critical thoughts. The paper concludes with a discussion of a number of examples interpreted in the light of the experientialist theory of categorization.

II. The Symbolic Transformation of Human Experience

Reality has a way of seeming objective and self-evident when we start to think about it. It is simply there and all we need to do is to open our eyes and we see it "plain as day." We see physical objects with well-defined edges. They seem solid and permanent. Although there may be a first-order reality 'out there,' as Watzlawick 1978 writes, we don't experience it as such. Instead each of us constructs his or her own reality, a second-order reality, "which is the result of our 'opinions' and our thinking, which thus constitutes our *image* of the first" (42). This "world image" is "the most comprehensive, most complex synthesis of the myriads of experiences, convictions, and influences, of their interpretations, of the resulting ascription of value and meaning to the objects of perceptions, which an individual can muster" (43).

Our second-order, 'working' reality is a transformation of the first-order reality. Langer 1948 contrasts the notion of 'transformation' with that of 'transmission.' Instead of our minds mirroring the world around us, receiving transmitted images of [the first-order] reality, the mind is likened to a great transformer. The current of experience that passes through it undergoes a change of character; . . .it is sucked into the stream of symbols which constitutes a human mind" (46). Symbolic transformation is the key to understanding human consciousness for Langer. The human response is "a constructive, not a passive thing."

All symbols simplify the "pandemonium of sheer impression," the chaos of ever-changing experience. They make life's infinite variations graspable, memorable, and communicable. They give us fixed points onto which we project our endlessly varying experiences. Our symbols have a gestalt-like character. The symbol is like a whole which is simpler than the many experiences which are like the parts. The concept TRIP, for example, symbolizes many complex kinds of experience, involving origins, destinations, provisions, and planning, but the concept itself is quite simple, as is the word 'trip.'

In summary, the thrust of the argument is that we transform or construct reality actively from our experience. We do this in a peculiarly human way which has its roots in our biological nature. The form of this transformation reflects processes which are innate in the human species. In the next section, recent literature on the biological grounding of human conceptualization will be reviewed.

III. The Biology of Human Conceptualization

Recent thinkers such as Lakoff and Johnson (Lakoff and Johnson1980; Lakoff 1987; Johnson 1980) have given a biological basis to the notion of symbolic transformation. They strongly reject the traditional "objectivist" position which assumes that symbols are "internal representations of external reality," that all members of a category share a common set of attributes, and that the correspondence is independent of the peculiar properties of any organisms (Lakoff 1987: xiii-xiv).

The focus on the centrality of the human mind in the construction of reality combined with the idea that this construction is primarily a symbolic transformation of what we experience raises the question of the nature of the transformation. That this transformation is lopsidedly cognitive and not just a perceptual processing of sense data from first-order reality is provocatively suggested by Heinz von Foerster's comparison of the number of synapses which are sensitive to the brain's internal environment compared to those sensitive to the external environment. "Since there are only 100 million sensory receptors, and about 10,000 billion synapses in our nervous system, we are 100 thousand times more receptive to changes in our internal than in our external environment" (von Foerster 1984: 52). I take this to be prima facie evidence that the brain does a lot of work after it receives sensory input through the five senses. What results from this work is concepts. Each new concept is a gestalt. The complexity of experience disappears once a gestalt-like concept is formed. Like most effective symbols, the concept itself appears simple, even if it is formed from a complex set of experiences. The simplicity of our concepts can be understood if they are conceived as points projected from many layers of experience. In other words, each gestalt has the simplicity of a zero-dimensional point but it remains connected to a residue of rich, complex images of particular multi-dimensional experiences.

Lakoff and Johnson argue for a view which they call "experientialism," or "experiential realism." This view rests on assumptions that much of our thought is "embodied." By this they mean that the structures used to put together our conceptual systems grow out of bodily experience and make sense in terms of it. Specifically, they argue that (1) "the core of our conceptual system is directly grounded in perception, body movement, and experience of a physical and social character," and (2) that "thought is *imaginative*, in that those concepts which are not directly grounded in experience employ metaphor, metonymy, and mental imagery. It is this imaginative capacity that allows for 'abstract' thought and takes the mind beyond what we can see and feel. The imaginative capacity is also embodied--since the metaphors, metonymies, and images are based on experience, often bodily experience. . . . Thought has *gestalt properties* and is thus not atomistic; concepts have an overall structure that goes beyond merely putting together conceptual 'building blocks' by general rules" (Lakoff 1987: xiv-xv).

The evidence that supports experientialism against objectivism is the subject matter of the three books by Lakoff and Johnson. It relies primarily on their analysis of category structure, which they show cannot be adequately explained in terms of sets of features shared by all members of the category.

Basic Level Categories

One of the important insights of recent work on cognitive processing is that one level of categorization has certain "basic" characteristics. The basic level is in the middle of categorical hierarchies. It is psychologically salient in human experience in terms of simple shapes and functions. For example, we organize our knowledge about animals around the habits of basic categories like dogs, cats, and cows, not around subordinate categories like poodles, Siamese, and Jerseys. We have distinctive words for the sounds they make (barking, meowing, mooing), but none for particular subtypes. Poodles and dachshunds bark. Cheshires and Siamese meow. Jerseys and Holsteins moo. Above the basic level, we also lack distinctive terms. There is no generic term for the sounds made by all animals.

Prototypes

The apparent simplicity of conceptual gestalts masks the complexity of the multiple senses that are frequently held together in one concept and its name. Wittgenstein's classic analysis of the category of games showed how difficult it is to define such an apparently simple concept like GAME. He proposed that the senses of such polysemous categories are bound together by "family resemblances." Like members of a family, each member has some characteristics in common with some other members, but there is no common denominator for all members. Furthermore, some members are more representative than others, that is, they have relatively more characteristics shared with other members. Such members are more central than others. The concept of centrality or representativeness within category membership has led to the development of prototype theory. Those members of a category which are more representative or central are said to be more prototypical. For example, robins and sparrows are more prototypical of the bird category than are penguins or ostriches. (Cf. Lakoff 1987: 40-46.) Membership in categories is influenced by human experience. New experiences are typically fitted into old categories. The fit is often imperfect and may stretch the category in new directions. However, each "stretch" is "motivated" by the existing membership; it grows from it organically and naturally by an extension of what already exists.

Idealized Cognitive Models (ICMs)

The gestalt simplicity of concepts masks the underlying complexity of the experiences from which a concept is abstracted. As we have just seen in the case of the polysemy, the abstracting from experience may involve a number of distinct subconcepts related by what Wittgenstein called family resemblance. But there is another kind of complexity which is masked by the apparent simplicity of the concept. Concepts exist against a background of links to other concepts. These background linkages play an active role in our use of concepts. Structures of linked concepts are models of knowledge derived from experience.

Lakoff calls these transformations "Idealized Cognitive Models," abbreviated 'ICMs.' ICMs are the organization of the knowledge we gain from experience. They are the result of the symbolic transformation of experience. Each new experience is unique and is rich in its particular details. But it can be related to previous experience by abstracting away from the rich particulars of an experience. In this sense it is "idealized."

Lakoff discusses four kinds of ICMs.

(1) "***Propositional models*** specify elements, their properties, and the relations holding among them" (113). For example, the concept MOTHER is linked through the BIRTH ICM to the concepts of PREGNANCY, DELIVERY, and DUE DATE. It is linked through the NURTURANCE ICM to concepts of CARETAKING, FEEDING, and CHILD-REARING. Lakoff points out that our understanding of the word "mother" depends on which ICM is being invoked. For example, "He wants his girlfriend to mother him" invokes the NURTURANCE ICM, whereas "She became a mother on April 12" invokes the BIRTH ICM. A sentence like "She's the mother of three boys" invokes both ICMs simultaneously.

(2) "*Image-schematic models* specify schematic images. . ." (111-112). They are abstract and simplified and lack the "rich" detail of actual images of particular sense data. These include shapes, paths, trajectories, our orientations in space like UP-DOWN, IN-OUT, FRONT-BACK, but image schemas can model data from any of the senses.

(3) "*Metaphoric models* are mappings from a propositional or image-schematic model in one domain to a corresponding structure in another domain" (114). For example, "Necessity is the mother of invention" maps the propositional BIRTH ICM onto a domain of experience, in which an experience of need results over time in the invention of something which didn't exist before. An example of a metaphoric ICM based on an image-schema is "I'm looking forward to Sunday" which maps the FRONT-BACK (or FORWARD-BACKWARD) image-schema onto the TIME domain of FUTURE and PAST.

(4) "*Metonymic models* are models of one or more of the above types, together with a function from one element of the model to another" (p.114). We have image-schemas of people with heads, faces, arms, legs, etc. We refer to them sometimes as "heads" (when we are counting their number) or as "hands" (when we are tallying a vote). Here one part of the image-schematic PEOPLE ICM is standing for the whole.

In each of these four types of cognitive model, human imagination plays a role in transforming the experience. Imagination is a way of conceptualizing the world and it is characteristically human, whether it be the use of metaphor or the use of propositions to represent experience. If, for example, our internal images of fire and anger can be matched in certain ways, we can extend the meaning of 'flare up' from fire to anger and say that someone's anger "flared up" (Langer 1944: 123-4). Lakoff (1987, Case Study 1) explores in depth the extent and elaboration of the metaphor ANGER IS FIRE and its associated metonymies in which one aspect of fire stands for anger, e.g. heat (He was hot under the collar), pressure (He almost had a hemorrhage), redness (He was red with anger), etc.

This section has reviewed the argument that Langer's symbolic transformation of experience is rooted in our biological predisposition to categorize reality in terms of basic, well-delineated experiences such as bodily orientation, e.g. HAPPINESS IS UP as in "He feels up today"; gestalt perception of objects and events, e.g. A PERSONALITY IS AN OBJECT as in "That's the ugly side of his personality"; and common metaphorical structures, e.g. LOVE IS MADNESS as in "He's crazy about her"). The fact that the same (first-order) reality may be categorized quite differently or viewed against different background assumptions (ICMs) suggests that the construction of reality varies greatly within one person at different times as well as between persons. The greatest differences would be between persons of different cultural backgrounds. In the next section, we will take up the old theme of relativity in light of the biological grounding of our categories of thought.

IV. Relativism or the Relativity of Reality

We have seen that experience is transformed symbolically into conceptual structures (categories and their relationships within ICMs) that are not objectively in reality but rather emerge from the cognitive processing of human interaction with a first-order reality. What a person understands about the world, how that is packaged for communication, and how it is understood by the person receiving a message becomes relative to the processing of his or her experience.

Each of us has experiences which we structure and store in a conceptual system by means of a species-specific conceptual capacity. And we each have a language which is a medium for conveying our thoughts about our experiences. In each of these four areas -- experience, innate conceptual capacity, acquired conceptual system, and acquired language -- there can be variation which results in individual differences in the conceptual system.

Much of relativism can be understood in terms of the conceptual system itself: the concepts, their internal structure and organization, the ICMs, and the use of the whole conceptual system. Language structure, in particular the distinction between grammaticized and lexical categories, correlates with aspects of use. Experience, as we have seen, plays an important role in the embodiment of the conceptual system; it also contributes to the fineness of the categorization of domains, e.g. the proliferation of terms for kinds of snow in Eskimo or for cooking in French, but these are generally superficial aspects of relativism without much significance.

Categories may differ in several ways from one conceptual system to another. In objectivist semantics, differences are limited to different ways of carving up reality. The assumption is that the "seams" of reality are given and that each conceptual system carves only along the seams. In areas of great cultural importance, more cuts are made and a finer set of categories results. "But such a view leaves out ... concepts which are not objectively in nature, but which are a result of the human imaginative capacity: cognitive models involving metaphor and metonymy, radial categories, and nonuniversal socially constructed concepts" (Lakoff 1987: 309).

A second source of relativism within the conceptual system itself is the idealized cognitive model (ICM). As we saw above, the ICM organizes knowledge in four different ways: image schemas, propositional models, metaphoric mappings, and metonymic mappings. Of these, the last two are the more likely to contribute to substantial differences between conceptual systems since they project the more basic image schemas and propositional models onto more abstract domains in unpredictable, though motivated, ways. In many cases, more than one projection is used for the same domain. For example, arguments may be structured by AN ARGUMENT IS WAR metaphor or by AN ARGUMENT IS A FOUNDATION metaphor. Lakoff and Johnson 1980 have shown how pervasive the metaphoric and metonymic structuring of experience is. ICMs play a background role in communication for whatever concepts are foregrounded by the mention of their names. It is even possible for certain elements in a sentence to make sense only by taking a background ICM into account. For example, the "but" in a sentence like "She's a mother BUT she works" makes sense only if we are aware of a background ICM for motherhood in which it is assumed that a prototypical mother doesn't work. ICMs structure our understanding and thought and must not be ignored as a source of relativism.

Relativism does not lead, as some fear, to chaos nor is it a rejection of an objective world. Our conceptual systems are constrained in two ways. First, there is an objective world, a first-order reality, which constrains our conceptual systems just as it constrains scientific theories. Popper 1959 has shown that a scientific theory is falsifiable but not provable. First-order reality says what can't be. Second, our conceptual systems are constrained, as we have seen, by the common conceptual capacity with its imaginative processes, by the common preconceptual experiences, and by our basic-level gestalt perceptions, which together give a biological foundation or embodiment to our conceptual systems.

V: Implications for Communications

The apparent obviousness of reality and the large areas of common experience that all humans share with each other frequently mislead us into believing that we can take mutual understanding for granted, that indeed we can accept the validity of a theory of communication that suggests that we simply transfer our thoughts from one person to the other by choosing appropriate words to reflect a given reality. But, to begin with, even when the words do reflect an undisputed reality, they usually do not convey the speaker's reason for speaking, that is, his or her intention. Only a few of our intentions are signalled overtly in our word choices or in the syntactic form of what we say. For example, the word "please" usually conveys that what we say is a request. An interrogative sentence type usually conveys that our intention is to get information, while an imperative sentence type is intended to cause the listener to do something. But it is much more usual for the speaker's intention to be inferred from the context and not given in the words or syntactic form. For example, the overt interrogative "Could you open the window?" usually conveys a request for the listener to open the window. Or the overt declarative "The door is right behind you" might be understood as a command to leave the room in the context of an argument.

The discussion of the experientialist theory of conceptualization warns us that there is yet another dimension of communication complexity beyond the inference of speaker intentions. The analysis of some misunderstandings reveals different underlying conceptions of situations, what we have called idealized cognitive models. The differences are often subtle but their effects in the responses of the communicators may be devastating. Communicators who are sensitive to the subtleties of difference learn to listen with great care, to check their perceptions of both verbal and nonverbal behaviors, and they are willing to spend energy on probing beneath the surface of communication when misunderstanding has occurred. In some cases analysis reveals individual differences that apply only to the current situation (example 1). In many other cases, however, the differences reflect more deeply rooted culturally-based conceptual differences. Example 2 exemplifies sexism in a cognitive model. Examples 3-7 are taken from cross-racial communication and illustrate how cognitive models may differ radically because the experiences of the members of different ethnic groups are very different. Examples 8-9 illustrate how the theory of prototypes can be applied to communication problems. Although we share identical concepts, we may use a word to convey a concept either in its central prototypical sense or in a peripheral non-prototypical sense.

Example 1: Individual Cognitive Model:

We never communicate every detail of what we intend. In this example, a communication problem occurred because the speaker's intention was unclear and the listener took the speaker's question as a personal challenge.

A woman compliments a man on his tie. He replies with a question, "Is it ok?" She responds both with impatience because the answer to his question is contained in her compliment and with annoyance because the question suggests to her that she did not mean what she just said. Analysis revealed that he doubted the appropriateness of his choice because the tie was twenty years old and was narrow by current standards and he feared that it would look out of style. She interpreted his question within a model in which repeating a question for no clear reason is interpreted as redundant or a personal challenge and is therefore either a waste of time or offensive.

Example 2: Sexism in a Cognitive Model:

The way gender-related words are used may reflect cognitive models of sex-roles in society. Robin Lakoff 1975 has shown that the sexist tendency of our society to define women in terms of their relationships to men goes beyond the oft cited adoption of a husband's name in marriage or the use of titles such as "Mr. and Mrs. John Smith." Lakoff gives the example of the words 'widow' and 'widower,' which are used differently by most speakers of English. One can say, "Mary is John's widow," which identifies Mary in relation to her late husband, but one does not usually say, "*John is Mary's widower," which would identify John in relation to his late wife. This example could also be interpreted in terms of prototypes. The prototypical man is seen as autonomous.

(*The asterisk indicates a sentence which is unacceptable for most speakers.)

Cross-Racial Examples

Cross-racial examples usually involve different cognitive models or stereotypes of groups. Frequently these models are not shared by members of both groups, though it is not unusual for members of an oppressed group to know the models used by an oppressing group.

Example 3: In discussing racial progress, liberal Whites sometimes point out with satisfaction certain gains in equality such as increased numbers of Blacks in previously segregated schools, in political office, in business, in sports, etc. Some Whites may conceptualize such data in a metaphorical cognitive model of a cup being filled. For them, the cup is half full. But for members of the group that suffers the effects of oppression daily, the same data are conceptualized in a different model, one in which the data are related to other data concerning how much oppression is still part of their lives. For them, the metaphor is one of a cup being half empty rather than half full. Such differences in underlying cognitive models will result in very different ways of describing the data on numerical gains and, more importantly, will result in very different attitudes toward reports of such gains. Blacks may express anger at the satisfaction that Whites take in reporting such data. Whites may express dismay at the lack of a shared sense of progress and become angry at Black insistence on a pessimistic response.

Example 4: Many Blacks stereotype Whites as having feelings of superiority to other ethnic groups. As a consequence, when a white teacher spoke of adjusting his teaching to the level of his students and those students were Black, a Black listener interpreted his statement in light of the Black cognitive model and interpreted him as having feelings of superiority toward his Black students. The White professor felt that he was expressing a generally appropriate teaching strategy.

Example 5: Another common Black stereotype of Whites is that Whites are insensitive and ignorant of Black realities. As a consequence, Black poems which include characterizations of Whites as insensitive and unobservant may offend and disconcert Whites who don't see themselves that way. Whites know that they are sensitive in many ways but may not see their own blind spots with respect to interracial interaction.

Example 6: Many Blacks see Whites as members of a "White community" parallel to their perception of themselves as members of a Black community. As a consequence, when Blacks refer to Whites as a group in recounting negative behaviors of some Whites, Whites may react with resentment at their inclusion since they may not include their White identity as a significant part of their self-concepts and don't want to accept responsibility for the behaviors of other Whites. Whites may cite nationality (American) or profession (doctor) or church (Protestant) as more prominent identifying group memberships than race and are more likely to accept responsibility for behaviors of these groups.

Example 7: An example of cognitive models in the process of change and how this interacts with word choice can be seen in the progressive self-relabeling by Blacks as social reality has changed. The connotations of "colored," "Negro," "Black," "Afro-American," and now "African American" show a progression of social realities, as Blacks have fought for change and won new respect for themselves. The use of the new terms in communication is a force in the process of social change. The new terms symbolize as well as help bring about the new realities, which are represented conceptually in the cognitive models of communicators.

Examples involving Prototypes

The concept of prototype explains some communication problems.

Example 8. The use of the masculine pronoun in reference to persons who may be either male or female as in "After the European arrived in America, he settled primarily on farms," assumes the male as the prototypical European and implies the non-prototypical and therefore fringe status of the female.

Example 9: The prototypical sense of 'know' involves direct perception in the here-and-now. Thus when one person says to the other, "I know you did it" based on circumstantial evidence, i.e. on a non-prototypical sense of 'know,' the listener may challenge in response "You don't know that" because the speaker offered no direct evidence. Both are using the word "know" within its range of denotation, but one speaker may seek to challenge another by limited his usage to the most representative sense of a word.

VI. Conclusion

This paper has reviewed literature on the Experientialist theory of categorization. The theory emphasizes the non-objectivity of human conceptualization and hypothesizes that the structure of human concepts is embodied in human experience and human cognitive capacity. The paper has interpreted a number of communication examples in light of this theory and has shown that both the prototypical structure of categories and the organization of our experience in idealized cognitive models may be used to explain problems in communication. Problems are most troublesome when the communicators see no rational basis for their difficulty and want to blame each other.

This paper has tried to show that unseen differences in our cognitive models underlie some problems in communication. It does not attempt to go beyond the analysis of several examples of intercultural communication. This analysis, however, may suggest to the reader that part of the difficulty in finding a common denominator of critical thinking across the disciplines is the different cognitive models that emerge from the modes of experience in each discipline. Not only are the concepts themselves different, but their relationships to each other are uniquely embedded in discipline-specific cognitive models. Communication across disciplines may be analogous to cross-cultural communication.

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Reasoning and the Arbitrary Nature of the Sign

George Teschner and Frank B. McClusky

In the work entitled *Course in General Linguistics*, which is a series of three courses of lectures by Saussure compiled by students and colleagues after his death, the following statement is made concerning what Saussure called 'the arbitrary nature of the sign.'

"No one disputes the arbitrary nature of the sign, but it is often easier to discover a truth than to assign to it its proper place. Principle 1 [The bond between the signifier and the signified is arbitrary.] dominates all the linguistics of language; its consequences are numberless. It is true that not all of them are equally obvious at first glance; only after many detours does one discover them, and with them the primordial importance of the principle."

We may ask further what are the consequences, if any, for reasoning, logic and for the theory of argumentation. There are grounds for believing that Saussure's principle of arbitrariness and its application to grammatical syntax extends to topics that have traditionally concerned the logician.

The Interpenetration of Logic and Grammar

For Saussure the description of the structure of a language state at a given moment in time, what he calls 'the synchronic fact', is what is meant by grammar. It consists of morphology and syntax. Lexicology, which treats of the meaning and the derivation of words, is excluded. Morphology, for instance, would describe the different tenses of the verb 'to be', or the declension of third person pronouns, and syntax would describe the various ways these forms combine. However, for Saussure, form and function are not independent, and it is only in abstraction that the declension of pronouns, or the conjugation of verbs can be separated from syntax. Furthermore, for Saussure it is not possible to separate, in actual fact, lexicology from grammar. Words that are found in a dictionary appear to have an existence apart from their relationships to other words, and therefore, do not appear to lend themselves to grammatical analysis. However, Saussure argues that grammatical structures can be found in what are usually regarded as the units of language. Among the many examples he uses, Saussure gives instances of where relations that would usually be expressed by cases or prepositions are found as compound words as in, for example, 'royaume des cieux' and 'Himmelreich' (kingdom of heaven),'moulin-`a-vent' (Windmill) or 'bois de chauffage' (firewood). In such cases there is grammatical and lexical overlap where no sharp boundary between the word, as a unit of language, and the syntactical structures that make it up, occurs.

overlap where no sharp boundary between the word, as a unit of language, and the syntactical structures that make it up, occurs.

The subunits that compose words are governed by the same sorts of laws that rule the combination of words into grammatical formations. The distinction between semantics and syntax depends on a somewhat artificial distinction between words as the units of language and the permissible forms, i.e. grammatical rules, according to which they are combined. Perhaps it is only the printer spaces separating words that give the illusion of a clear division between semantics and syntax.

This systemic interpenetration could apply as well to larger combinations of signs in which the basic units are statements, and the composites are logical arguments. What Saussure has said about grammatical structure may extend, by analogy, to what is called logical structure, namely, that there is no clear division between the form and content, meaning and relation, semantics and syntax. The felt forces of necessity that compel assent, in logically valid arguments would therefore, not to be understood as entirely independent of the semantic practices governing the use of words that constitute the content of the argument.

The Arbitrary Nature of the Sign

To say that the sign is arbitrary, for Saussure, is to say that there is no necessary relationship between the signifier and the signified. There is no reason in terms of the physical attributes of the word 'dog', and the animal that is called a dog why the same object could not be named by any other word. This is not to say that there are not conditions, within a given linguistic system, why one word rather than another is used to denominate a given object. The point, however, in saying that the sign is arbitrary is that the reason for why one sign, rather than another, is used is not to be found in anything that is intrinsic to the nature of either the sign or the signified. The necessity for a sign is to be found in the relationship that exist between a given sign and the system of signs of which it is a part. The name 'Samson', for instance, would be inappropriate for a small lap dog but a fitting name for a great dane. This is explained according to the way in which this sign fits into a system of signs and the different uses to which it is put. The same impression of arbitrariness is felt in comparing different natural languages such as English and German and finding that there are different sounds and inscriptions, such as 'dog' and 'der hund', that are used to denominate the same object. If many different names can be used to name the same thing then there is no intrinsic reason why one name rather than another is used. It is clear that, for Saussure, the felt necessity that is experienced in using a word is to be explained by its place within the system of signs. Any direct connection between the sign and the signified is not to be found.

Saussure considers what some would offer as exceptions to the principle of arbitrariness, namely, onomatopoeic and interjectional expressions. The word 'boom' used to describe an explosion sounds like what it describes. 'Ouch' expresses a feeling of pain, yet it is close to the sound that is made as a natural physiological response. There is a causal relation that is present here that challenges the principle of arbitrariness. Saussure's own comment to these objections is that such words are very few in number and they never really become organic parts of the linguistic system. When they are introduced they most often are subjected the same phonetic and morphological changes as other words in the language until any connection to their signified disappears. In fact many of the interjections of different languages, that translate as having the same meaning, differ from one language to another as a result having undergone an evolution that is particular to the systems of signs of which it is a part. Saussure dismisses these objections by saying that,

"Onomatopoeic formations and interjections are of secondary importance, and their symbolic origin is in part open to dispute."

Saussure also contrasts the sign which is arbitrary with the symbol which bears a natural connection with its signified. The example that he uses is the symbol of justice, a pair of scales, where there is an analogical connection between the signified and the signifier which for instance could not be arbitrarily replaced by the image of a chariot. In the case of the symbol we have an intrinsic connection between the nature of the sign and the object. Yet, if we were to ask why a pair of scales, rather than, for instance, a lever balanced on a fulcrum, is used for the symbol of justice, it would become necessary to examine the system of signs of which that particular symbol is a part.

These observations come as no surprise and most would regard them as obvious. Saussure admits the same, but says that the importance of the principle is revealed when it is assigned its "proper place". The proper place for the principle of the arbitrary nature of the relationship between the signifier and the signified is in the context of trying to account for the grammatical, logical and epistemic necessity that is felt by a linguistic community in using its language to describe the world. How is it that strict limits are imposed on the individual speaker in such a way that he does not have the power to change the language once it has been established? This is relevent to understanding what is meant when it is said that one statement "supports" another statement when reasoning moves from premise to conclusion.

The Arbitrary and the Differential

The next step for Saussure consists in understanding that the arbitrary nature of the sign is correlated with another major feature of linguistic systems, namely, the fact that the meaning of a term is derived from the difference between it and terms which are proximate to it in meaning. In other words the meaning of a term consists in the difference between it and terms with which it is said to be synonymous. Saussure says that,

> "...a segment of language can never in the final analysis be based on anything except its non-coincidence with the rest. *Arbitrary* and *differential* are two correlative qualities."

The best illustration of this comes from phonics. If I say that "There is a cat." and someone else says "What cat?", it is assumed that the same word occurs in both sentences. Yet from the point of view of the physical properties of the sounds the words were not strictly speaking the same. Two different speakers are present in the exchange. The pitch and volume of their voice is different, one speaks slower than the other, the inflections of the words are slightly different, etc. What then is meant by saying that the words are the same? Saussure's answer is that the sound of the word 'cat' pronounced in both circumstances is sufficiently different from other words which it is like, such as 'hat', 'mat', 'sat', 'fat', etc., that we are confident in saying that it is the same. However this sameness consists in its difference from other words with which it might be confused. The same is true semantically. Saussure says,

> "...., all words used to express related ideas limit each other reciprocally; synonyms like French *redouter* 'dread', *craindre* 'fear', and *avoir peur* 'be afraid' have value only through their opposition: if *redouter* did not exist, all its content would go to its competitors."

Just as the sound of the word 'dread' is not same phonetically each time it is pronounced by different speakers, the meaning of the word 'dread' changes from situation to situation. The sameness consists in the difference between it and synonyms such as 'anxiety' and 'fear' which could conceivably be substituted for it. The meaning of a word then lies in its differential relationship with other words, not in something that stands independently and non-relationally. Saussure is conceiving of language as a system, the parts of which consists in the absence of other parts. Saussure uses the analogy of a train to explain this further. We might speak for instance of the 5:50 train to Boston. In what does its identity lie? All trains might be delated by two hours on a given day so that the 5:50 would arrive at 7:50, yet it would still be the 5:50 train. The engine and the cars could be different, the conductor not the same. It could switch to a different track, and even arrive at a different station, and still be the 5:50 train. Its identity for Saussure does not consist in anything positive, but rather in the difference between it and other trains with which it might be mistaken, such as the 4:50 to Boston or the 5:50 to Albany. Its identity resides in its difference.

Let us recapitulate. Since the relationship between the sign and the signified is arbitrary it becomes necessary to explain the feeling of limitation and necessity that is experienced in our choice of words.

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Saussure accounts for this not by the relationship between the sign and what it signifies, which he claims is arbitrary, but by the relationship that exist between a word and the other words and phrases that constitute the linguistic system of which it is a part. The meaning of a word is the difference between it and other signs in a system of signs. The meaning of a sign is not any positive entity.

Implications for the logic of Natural Language

Saussure's notion of interpenetration, arbitrariness, difference, and the dependency of the signified upon the signifier have important implications for informal logic and argument analysis. It is necessary first to recognize that arguments in formal logic are fundamentally different from arguments stated in natural language. Formal logic presupposes a detachable form that remains the same from statement to statement and which can be analyzed independently of any semantic considerations. But for Saussure the semantic and syntactic elements are not entirely separable. Formal logic therefore would not represent the formal features of natural language stripped of its content, but would instead be another linguistic system with its own particular syntax and semantics and its own set of rules governing transformations between itself and other linguistic systems. Formal logic may serve as a valuable analogy for natural languages for the purpose of considering some features in abstraction, but it remains a language in its own right with its specific limitations and uses.

The argument, "The coffee is ready because there is steam rising from the pot." is an argument stated in natural language having one reason and one conclusion and an inference indicator that makes the logic of the relationship explicit. The most common explanation for the relationship of reason to conclusion is that one statement "supports" the other, or, in other words, that one serves as "grounds for believing the other", or again, in other words, that the conviction that was felt in one statement, by virtue of the argument, has been transferred to the other, and so on. However such explanations offer no insight into the origin of the forces that are at work in a series of statements that are judged to be related as reason is to conclusion.

How does the principle of arbitrariness, difference, and the systemic nature of language provide insight into the argument, "The coffee is ready because there is steam rising from the pot?" It would follow that for Saussure this string of signifiers is part of a linguistic system that contains a network of differential forces that prevent the statement from collapsing into ambiguity. These same forces are what are felt in moving from the reason to the conclusion of an argument. Just as in the definition of anxiety we might be inclined to say that it is not as great as dread but it is more than fear, and thus define the word negatively by showing what it is near to but different from, the same would be true of words in the sentence such as 'ready', 'steam', 'rising', 'coffee' etc. Synonyms for the word 'rising' are 'ascending', 'soaring', 'climbing', 'escalating' etc. but these are nevertheless different from the word 'rising', because it is more appropriate to say that mountains are climbed, and stairs are ascended , planes soar, and wars escalate, rather than using these words with the word 'steam'. To say, "The coffee is ready because the steam is escalating from the pot." at least weakens the degree of support or even makes the reason irrelevant to supporting the conclusion. To the say, "The steam is soaring", could conceivably establish the contrary of the conclusion, since it may be proof that the coffee is overheated. To use the words 'condensation', 'fog', 'mist' or 'vapor' in place of the word 'steam' would create similar difficulties, and if we were for some reason required to use these synonyms, then it would be become necessary to alter the syntax, or change the context all together, in order to approximate the force of the original argument. The argument itself in turn could be regarded as a linguistic unit that is part of a larger system of signs so that once it has been accepted and established, it becomes permissible to use other strings of signifiers such as the statement, "We now can serve the guests." The principle of the arbitrary nature of the sign would say, however, that this is necessary, not because of a relationship that exist between the argument as a signifier and the signified as an objective state of affairs, but because of the differential role that the statements play in a linguistic system.

How do these observations help in the analysis, evaluation and strengthening of arguments? To begin to answer this question we must understand that for Saussure there are two distinct groups of relations in language. One set of relations is based on the linear nature of language, namely, the fact that the elements of language occur in succession, and that for instance, two words cannot be pronounced at the same time. In writing, this is represented by the linear articulation of graphic marks. Combinations result from the sequence of elements, and earlier elements of the sequence limit the possibility of later elements. This Saussure calls 'discourse'. Discourse stands in contrast to what Saussure calls 'associative relationships' which are not linear strings of signs that occur in succession but are groups related together simultaneously in memory. These group of relations are the source of synonyms which are drawn from memory by association. Grammatical and logical relations, on the other hand, are to be found in the combinations that are supported by linearity. The suffix 'verse' can be combined for instance with different prefixes such as in reverse, traverse, converse, inverse, subverse, etc. but not with disverse or oververse. These different combinational possibilities are examples of linear relations on a morphological level. On a grammatical level one could begin for example with the sequence 'she leaned' which then could be followed by certain combinations of words and not others. We could say "she leaned forward." or "she leaned backward," or "she leaned toward..." to be followed by further combinations of elements. However we could not follow the phrase "she leaned" by the words 'tool', 'environment' 'separated', etc. This same analysis extends to larger sequential combinations such as are found in discourse consisting of reasons and conclusions. It would follow that for Saussure these larger units would be a continuation of the same forces at work that produced the morphological and grammatical combinations. The statement "the coffee is ready because" has only certain statements that it can be followed by if it is going to constitute part of an acceptable sequence of words. All of these sequences, whether the combinations be morphological, grammatical or logical are motivated by difference. This means that the same forces that were encountered in considering the synonyms for given words and the differences that kept the synonyms apart, are also those that are at work in the generation of the linear sequence of signs that constitute grammatical and logical discourse.

Traditional argument analysis treats the statement as a unit and by means of arrows and tree diagrams delineates the relationships of support between reasons and conclusions. From the present point of view this unit, namely, the statement itself, must be penetrated in order to uncover the origin of these forces in the differences that exist between words and their synonyms. The differences found in associative relationships produce the sequential combinations of grammatical and logical structures.

Argument ***analysis*** in the light of Saussurian linguistics would explore the words and their synonyms in the statements making up the reasons and the conclusions of an argument. ***Evaluation*** of the strength of an argument would compare the degree of resonance between the words and phrases and their synonyms in the reasons and in the conclusions. ***Strengthening*** arguments would explore the possibility of substituting synonyms in place of the original words of the argument.

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Critical Thinking and Informal Logic

This section addresses concerns that are at the focus of much of the work in critical thinking: issues involving informal logic. Informal logicians are concerned with argumentation. Their concerns focus on how claims are warranted and the identification of typical and general problems that weaken the arguments put forward in support of claims. The first two papers in this section deal with specific kinds of problems in argumentation. Mark Battersby attempts to analyze appeals to authority, which although commonly thought of as fallacious, are central to many arguments. Joel M. Auble looks at another source of fallacious reasoning, the use of anecdotal evidence, and seeks to expose its characteristic structure. The final paper by Wm. Richard Brown is more general, attempting to analyze fallacious reasoning in terms of underlying competence and performance errors. All three demonstrate the diversity and richness of the contribution of informal logic to critical thinking.

Mark Battersby speaks to the central role of authority in making and assessing claims, in his paper *Assessing Expert Claims: Critical Thinking and the Appeal to Authority*, Battersby speaks to crucial role of appeals to authority in "the accumulation of knowledge" and explores the frameworks that determine whether appeals to authority are warranted or unjustified. He claims that "a useful model can be found in the legal use of authorities or experts--especially for illuminating the use of authorities in situation of obvious bias." Battersby attempts to offer an analytic model for appeals to authority "in general, in the public forum, and in representative disciplines." His model takes as its goal "the development of rationally justifiable rules of thumb."

Joel M. Auble continues the exploration of topics in informal logic in his paper *The Anecdote as Evidence*, taking as his focus those arguments that begin with phrases such as "I know a case in which..." Auble asks "What is there about a personal experience which suggests to some that our critical faculties can be put on hold? What, if anything, is wrong with basing our reasoned judgments on such evidence?" First examining the relation of anecdotal evidence to the fallacy of hasty generalization, Auble claims that "upon examination, we find more interesting matters present in our use of the anecdote." These include a shift of emphasis from "the issue of evidence to the issue of trust in the person presenting the anecdote." The role of such a shift in changing the way such information is assessed and the relation of anecdote to other sorts of evidence is examined as well.

The last paper in the section on informal logic relates fallacy theory to grammar. In his paper, *Q: How Is a Logical Fallacy Like a Grammatical Error? A: For All Intensive Purposes, Thier the Same Exact Thing*, William Richard Brown looks to this comparison in order to "reveal something significant about the student, who enters our classes already thinking and writing in some fashion." Using the concepts of performance and competence found in transformational grammar, Brown asks us to distinguish between the underlying competence that students have and the errors of performance that characterize much of their work. Given that distinction, Brown argues that "logically deviant sentences, like ungrammatical ones, often make more sense than we think, once we have reconstructed the framework within which they were produced."

Assessing Expert Claims: Critical Thinking and the Appeal to Authority

Mark E. Battersby

Introduction

Much of our understanding and knowledge of the world is based on the authoritative pronouncements of experts. Both our scientific and historical understanding is grounded in this way. Think of the germ theory, astronomy, plate techtonics, ancient history, dinosaurs, the origin of humans; it doesn't take much reflection to see that most of our understanding of the world is in fact grounded on information supplied and warranted by experts. Given how much of our knowledge has this basis, one would think that epistemologists would have given detailed consideration to the issue of appeal to scientific and other intellectual authority. But appeals to authority and the role that authority plays in knowledge has received little attention in modern philosophy.

Indeed, philosophers generally have been opposed to such appeals since the very birth of Western philosophy. Greek philosophy distinguished itself from Greek theology by rejecting appeals to authority (the wisdom of the ancients or the oracle's supply of the word of god) as the primary basis of knowledge and replacing these appeals with appeals to observation and reason as the basis of knowledge. Philosophy in many ways began with rejection of authoritative pronouncements, and when philosophy revived in the 17th century, the aversion to authority reappeared. Descartes, Bacon, and Locke, by rejecting the authority of both the church and Aristotle, helped pave the way for modern science. These authors all rejected the appeal to any authority and in doing so marked the beginning of modern philosophy with its emphasis on individual confirmation of claims.

As a result of this history, most contemporary introductions to epistemology do not even mention the issue of appeals to experts and authority, and there is little in contemporary epistemological literature that concerns itself with this topic.[1] But one might expect Critical Thinking with its concern with the practical needs of knowledge assessment would devote considerably more attention to appeals to authority. In fact, most Critical Thinking texts do not even refer to appeals to authority and only a few texts give the subject significant treatment; none of these treatments are adequate--in part perhaps because there is no epistemological theory on which to base such a treatment. Of those that do treat such appeals, many give appeals a definite secondary and necessary evil status, e.g.:

> ...in fact generally speaking we only appeal to experts, if in fact, it may be too expensive or otherwise difficult for us to have direct evidence. That is why we may legitimately appeal to experts as a secondary source of subjective knowledge when we have to make a decision. (Walton 1987, p. 187).[2]

There are at least two reasons for such neglect. One is the philosophical tradition mentioned above, but perhaps the most important reason is that appeals to authority seem to violate the spirit of Critical Thinking. After all, wasn't Critical thinking meant as an antidote to students' all too willing acceptance of the authoritative pronouncements of teachers and textbooks? Aren't we supposed to be teaching students to question, not accept authority? Indeed the very Latin name for the traditional fallacy of appealing to authority, ad vercundiam, means literally the appeal to modesty or shyness, and it is not too far to interpret this as inappropriate deference.[3] And surely it is just such deference that we as teachers of Critical Thinking wish to eliminate. As Locke stated:

> For I think, we may as rationally hope to see with other Men's Eyes, as to know by other Men's Understandings. So much as we our selves consider and comprehend of Truth and Reason, so much we possess of real and true Knowledge. The floating of other Men's Opinions in our brains makes us not one jot the more knowing, though they happen to be true, What in them was Science, in us but Opiniatrety, whiles we give up our Assent only to reverened Names, and do not as they did, employ our own Reason to understand those Truths, which gave them reputation.... In the Sciences, every one has so much, as he really knows and comprehends: What he believes only, and takes upon trust, are but shreds; which however well in the whole piece, makes no considerable addition to his stock, who gathers them, Such borrowed Wealth, like Fairy-money, though it were Gold in the hand from which he received it, will be but Leaves and Dust when it comes to use *(John Locke, An Essay concerning Human Understanding, I, iv, 23 quoted in Welbourne, p. 49).*

Plausible as this objection is, it obviously cannot be allowed to stand. Too much of our very real knowledge is based on just such condemned sources. While only a few contemporary philosophers have noted this and attempted to outline the significance that authoritative appeals have to epistemology, John Hardwig has shown that even physicists are heavily dependant on the expertise of their fellow physicists in order to develop and understand their own experiments. Hardwig points out that it is not untypical for 30-50 physicists to be involved in a major experiment because only with that range of expertise can the data be assembled and understood. And the final result relies for its credibility on the trust and respect that the participating physicists have for each other, since no single individual is competent to carry out more than a few of the operations involved.

Given the import of appeals to authority, it seems obvious that we should have a proper theory of such appeals. This theory should have implications for epistemology generally, and to Critical Thinking in particular since a great deal of what a critical thinker must do involves assessing the claims of genuine and would-be experts. A critical but appropriate approach to authoritative appeals must replace not only deference but also the narrow model used in contemporary Critical Thinking texts.

To develop an analysis of appeal to authority that could be used by the teacher of Critical Thinking, I will first critique the typical model of proper appeal to authority used in Critical Thinking texts, contrast this model with the model suggested by court proceedings involving experts, sketch an alternative conception of knowledge which places appeals to authority in the appropriate central role, and finally show how all this can be used to illuminate and improve the teaching of Critical Thinking. A task of such magnitude is, of course, impossible in the limited time allowed for presentation at this conference, as a result many important issues will receive short shrift. My hope is at least to sketch the outline of a new approach to authoritative appeals and its implications for Critical Thinking.

Critique of the Traditional Approach

The typical analysis of arguments involving appeals to authority is as follows:

A has asserted P

P falls within area of knowledge K

A is a recognized expert regarding K

Therefore, P is acceptable (Govier 1988, p. 83)

Some authors including Govier and Blair and Johnson, also point out that there are additional considerations surrounding such an appeal, including that:

1. The expert must not be in a position of bias
2. The experts on K agree about P
3. The more eminent the expert the stronger the appeal.

Difficulties with this Approach

Before exploring the difficulties with this approach, I must make a rough, and I hope uncontroversial distinction between particular and general judgements. By this distinction I have in mind the difference exemplified on one hand by an engineer giving her view as to why a bridge collapsed (a particular judgment) and the other, giving the physical and engineering theory of stress (general judgment). The reason for this distinction is that an expert's expertise is utilized in different ways in the two differing kinds of judgements.

In the typical complex particular judgement, the expert is called upon to use both her explicit and implicit understanding of the issue. In the particular judgement there is more reliance on the expert's individual expertise, her experience and even eminence in her field. Whereas, in the general judgement we are relying on the experts knowledge of views held in her field--her responsibility in enunciating this knowledge is to convey the wisdom of the discipline, not her personal views. In the case of general claims the expert is primarily a vehicle for transmitting the views developed and confirmed in her discipline. Significantly this is characteristic of the situation we find ourselves in as teachers: we are essentially the conveyers of our disciplines' knowledge.

If indeed the expert functions differently in the two sorts of judgement, then any adequate model of appeal to authority must recognize this distinction. But no model I have found does so. Those models which emphasize the eminence of the authority as part of the criteria of assessment seem to be basing this on the particular judgement model; those that only mention the importance of consensus of the experts discipline seem concerned only with the general claim.

In Critical Thinking we are dominantly concerned with the expert as a source of general claims, e.g. the nature of solar system, the causes of cancer, etc. For this reason we are dominantly concerned with the expert as representative of her discipline rather than as someone using her expertise to make a particular judgment. In order to limit the topic of this paper I will only discuss appeals to authority in relation to general claims. Though there is much to be said about particular claims, especially in value-oriented disciplines and everyday decisions.

What are the implications of the observation that the expert is primarily a vehicle for transmitting her discipline's knowledge rather than an individual source of knowledge? First, we must abandon the model of the expert as someone who can give us knowledge simply by telling us her view. We listen to experts because they are representatives of a body of knowledge. That is why there should not be expert disagreement in the fields to which we are appealing: we are not really interested in the expert's personal opinion, but rather that of her discipline; if there is no consensus in the discipline then the discipline has in a sense nothing to (univocally) say. Only by viewing the expert as a discipline spokesperson can we understand the requirements of appeals to authority, deal with Locke's objection, and even make sense of our role as teachers of Critical Thinking.

Expert Disagreement

One thing that should flag us to the weakness of the traditional analysis is the way that it has disagreement among experts render appeals to authority fallacious. Many of the interesting cases with which one has to deal with involve conflict among experts. What about competing doctors opinions, conflict in the press between experts on proper AIDS treatment, cancer causes etc.? The courts must deal with expert conflict as a matter of course. Are all such conflicts to be deemed sufficient ground for dismissing the expert opinions presented? This seems much too drastic to be sensible.[4]

Legal Approaches to the Use of Experts [5]

Rather than dismiss competing expert claims the courts insist on the expert not just delivering her opinion but also her explaining her reasoning. Given the model of expert appeal I am criticizing, this would seem surprising. Should not one just accept the claim if the expert has the relevant credentials? But the court is: 1. faced with a conflict between experts, and 2. feels too responsible for the decision to simply bow to the authority of the expert.

Locke's objection would be taken quite seriously by the courts. They cannot be utilizing mere "opiniatrety" because they are responsible for the decision. The court's compromise is to take expert opinion but require that the expert explain herself so that the court can both judge (where there is conflict or just doubt) and understand.

Because courts have to deal with conflicting testimony, they have to make a judgement on the merits of the expert's argument. They assess the clarity, methods, apparent bias and plausibility of competing experts' explanations in order to decide how to weigh the opinions. The expert in the courtroom is an exception to the general rule that the court does the reasoning and the witnesses are merely to report what they saw, heard, etc. But because the expert's opinion is based on reasoning from the facts and not merely the assertion of them, the court reserves the right to examine this reasoning. In doing so it is not impressed with the prohibition of only considering character questions when evaluating testimony not argument but rather it uses all evidence it has before it to determine the weight to be given to the expert's claims. It seems to me that this is exactly the right strategy for any rational person to take.[6]

The court's procedure should show us that the sharp distinction made between testimony and argument is untenable. We need the expert's credibility before we will believe her arguments, but her credibility is not all we will rest our appraisal on. Argument assessment is to some extent discipline-specific and for this reason we need the assurance of the expert that this line of reasoning, these types of inferences are respected within her field. We also need her reassurance that she is not ignoring counter-evidence or contrary opinions within her field. We must of course also comprehend and be persuaded by the evidence and explanations, but even allowing our understanding to be moved by the expert's account is itself an act of trust in her authority.

But the crucial point for critical thinking is that appeals to authority must involve justification and explanation. What the Lockean model (and the contemporary one given above) ignores is the expert's obligation to supply justification for her position. The model cannot tolerate disagreement among experts because it provides virtually no method of adjudication. This is the most crucial objection and indeed is the basis of Locke's criticism: the model seems to require just too much mindless trust in the experts. By not requiring that the expert provide any argument, explanation or justification for her assertion, the model leaves the believer in a hopeless state of acute epistemic dependence.[7] It also leaves the layperson who accepts the claim with probably no real understanding of the claim she has accepted.

Appeal to Authority and Education

To the extent that education consists simply in telling without justification and explanation, it too leaves the student in a state of epistemic dependence (to say nothing of ignorance!). But without trust in authority, there would be no successful transmission of knowledge. We believe in the biological theory of germs in part because it is explained to us in a manner that makes sense, but also because it is supplied and backed by a well-established discipline. Surely we all now know that it's quite easy to make a plausible explanation of some phenomenon which simply does not stand up to careful empirical or dialectical attention. The only way we know that the plausible explanations which are supplied to us by our teachers are indeed correct (not just plausible) is because of the credibility of the source.

But without the explanation we are (as we often are) in the position of saying "I don't know, but they say." By not being in the position to give any argument in favor of the claim (even the fact that its based on so many tests, or fits in with existing understanding or whatever), we are admitting that we don't really know the claim to be true, but have some authoritative reason to believe it. This is the weakest of all appeals to authority and should hardly be our paradigm.

Legitimating the demand for explanation and justification is therefore the key to the proper use of authority. It provides the grounds for the layperson's understanding to the claim, it provides the opportunity for the layperson to adjudicate between the claims of competing experts, and it provides for evaluation in fields that are not characterized by consensus.

Appeal to Authority in Value-Laden Fields

Most authors exclude appeal to authority in value-laden disciplines. But what about great moralists, literary critics, aestheticians? Is there no place for appeal to authority in these cases? Perhaps the appeals are weaker, but are they fallacious? Are these to be all ignored? Lacking a theory to justify the rejection of such appeals to authority, it is hard to see what the basis for rejection of appeals to authority in art criticism, philosophy, etc. are based on. There certainly is expertise among literary and art critics, architects, and town planners, though all these fields are rife with value appeals. But I simply do not have enough space to deal with these claims. Let me just suggest though that any discipline qua discipline must have standards which are more or less consensually shared otherwise there would be no discipline, no way to justify awarding degrees, grades, etc.. To the extent that there is some underlying consensus a powerful case can be made for legitimate appeals to at least consensually held views. Again this all requires a good deal of development.

Eminence

My last, and certainly not most important criticism of the standard model, concerns the claim that the more eminent the expert, the more successful the appeal. In most (general) cases someone with adequate and appropriate knowledge of a field--such as a local professor--is all we need, remembering that it is not her expertise that we need so much as her competence to transmit the discipline's knowledge. And in some cases there may be problems in appealing to an eminent expert in that she may be vulnerable to bias or suspicion of bias because of her involvement with a leading theory (or even dissenting theory). Given that generally all we need the expert for is to convey the knowledge of the discipline, eminence is not a necessary criteria.

The critique developed above is based on the view that a large part of knowledge is grounded not in observation or intuition, but expert consensus. While there is little space to develop the justification for this position, I wish to make a few remarks in support of it. Whatever the theoretical problems that may be discovered with this position, it seems to me unquestionable that the layperson has justified belief in most theoretical propositions just in the case that she knows these beliefs to be supported by the relevant discipline and has some minimal grip on the justification that supports them. I will call the view that knowledge is grounded in expert consensus the "social theory of knowledge".

The Social Theory of Knowledge

While various philosophers since Descartes have attempted to diffuse the skeptical effect of Descartes' approach, few have abandoned the essentially individualistic approach that led to the skeptical result. But when we start noticing which claims people typically say they "know," we can easily observe that these include theoretical (general) claims of their scientific culture, not just claims about their own experience. For example, the view of the solar system as involving planets that revolve around the sun--indeed the picture of the solar system that appears in every popular text on the subject, is a view that most people would claim (rightly) to know to be true. We also know that the material world is made of atoms that combine together into molecules, that bacteria and viruses are the causes of diseases, that burning is a form of rapid oxidation; the list goes on.... Not everyone may claim to know these, but that is a testimony to their ignorance, not their insight into the true nature of knowledge. And how many of us know these facts in any great depth? In particular, how many of us could prove or even cite the observations that prove them? Are we rendered into a state of mere "opiniartery" as a result?

I think the answer is clearly no. In fact, as Hardwig and others (Walsh, Lehrer) have pointed out, science itself is characterized by mutual dependance and trust among its members. Those who have shown that science is inadequately grounded by experimental evidence are correct, but this does not have to lead to relativism. Rather it underlines the crucial role that collective evaluation plays in the establishment of a scientific theory. And the success of this social process is what justifies the layperson's confidence in the results, and justifies appealing to expert pronouncements. There is much more to say here and I draw the reader's attention to the articles of Stitch and Ross, Walsh, and Lehrer listed. But now I wish to turn to the practical implications of my view.

Teaching and the Social Theory of Knowledge

The primary job of a teacher is to transmit knowledge. The teacher is not in class to share her beliefs, opinions etc., though of course we all do (and do so rightly, but that is not our main job). We are the representatives of our disciplines and we come to class to pass on to our students what the discipline believes is both important and true. This is seen most easily perhaps in those disciplines where course content is clearly delineated such as calculus, and 1st year physics, but it is quite similar for English 100 or even Critical Thinking courses. Since I am writing for Critical Thinking instructors and since that is my area of expertise, let me illustrate my point by first discussing the role of a Critical Thinking instructor.

It is one of the curious aspects of the discipline of Critical Thinking that the deeper epistemological worries of philosophers seldom surface in the texts or in class. Teaching introductory philosophy is always a case of teaching " on the one hand, but on the other...". Whereas, in Critical Thinking classes, we unabashedly teach students the norms of reasoning. And we are, I would certainly argue, quite justified in doing so. Of course, we do not teach that our particular analysis of a piece of text is a case of knowledge, but we do teach that the "following considerations should be taken into account when assessing a claim based on testimony." We do not teach these epistemological norms as mere beliefs--rather we teach them as part of the "know how" of being a critical thinker. This does not and should not preclude giving the rationale for these rules, but these are rules which a student must know in order to be able to do analysis and arrive at reasonable beliefs about claims and arguments.

We ask ourselves as Critical Thinking instructors "what basic rules and skills does a student need to know in order to evaluate arguments?" Note that we ask what a student needs to "know" not "needs to believe." Indeed if we ask that question it sounds like we are involved in manipulation. As teachers we only have a right to transmit what we know. We can, of course, tell our students what we believe and why, but we do not teach them, instruct them and test them, about our "beliefs." And how do we distinguish between the justifiably teachable and testable and our other beliefs? Is it not our perception of the consensus of our discipline that guides us? In teaching Critical Thinking, as in logic and math, we are operating in an area of significant discipline consensus and are authorized therefore to teach "one handed" philosophy: teach the accepted theories as knowledge. In those cases where our own beliefs differ from our perception of the consensus, we are obligated to flag this to our students and to have this recognition govern our procedures.

Implications for Teaching Critical Thinking

If indeed scientific, historical and perhaps all theoretical knowledge is grounded in collective decision procedures, especially those of academic peer review, what are the implications to teaching Critical Thinking students about authority?

1. The assessment of authority must be given a more central place in our textbooks. Equally importantly it must not be understood (as it typically is) as simply an appeal to the claims of an individual with appropriate expertise, but rather as an appeal to the claims supported by the discipline's consensus, for in cases of general judgments, the expert is primarily a well-informed reporter.

2. We must recognize that most knowledge and information is going to be supplied to our students (and ourselves) by experts. As a result the

responsibility for the critical thinker becomes principally one of learning how to assess sources and expert claims. The student must be taught how to do this, indeed we must, as teachers of Critical Thinking, think more about this ourselves.

As Hardwig points out, when assessing experts we must frequently resort to a variety of *ad hominem* considerations. To the extent this is true we should supply our students with the methods of appropriate *ad hominems*, e.g information about the sociology of the disciplines (perhaps even how to read citation indexes), creditable journals, and how to detect when experts are going beyond "authorized" claims. We need to teach about the kind of blindness that is apt to infect experts, and about the fallibility and limitations of scientific claims. We must teach our students their legitimate right to question experts and how to assess their answers. It is easy enough to promote the slogan "question authority" but without giving students the norms to assess the answers and defend the questions, we do not give them the rational confidence necessary for this questioning to be productive. We all know how to do some of this, but much more could be done in developing the rules of thumb that we could pass on to our students.

3. The role of consensus must be explained and emphasized. We should explain to our students why consensus or the lack of it is so relevant to assessing appeals to authority.

4. A new model of appeal to authority must be taught which emphasizes the importance of the expert providing explanation and justification. Below is a preliminary sketch of a new model of appeal to authority. Because of lack of space I have focused on only one type of claim: an empirical/general claim, but obviously similar models would be needed for all four possible types (including value/general and value/particular).

A says P.

  P is in A's area of competence.

Is P's claim particular or general?

  If Empirical/General then:

    What is the nature of A's discipline: fractured or homogeneous?

    If homogeneous then:

    Is P a well accepted claim in A's discipline?

  If yes,

    Why is P well-accepted?

    If explanation is plausible and intelligible, then P can be considered knowledge.

If no,

Why does A believe P?

Is the claim intrinsically plausible?

The more implausible the claim, the more evidence necessary.

Is the justification plausible?

Are the reasons for rejection of other positions plausible?

What are A's credentials relative to discipline?

What are A's likely biases?

Prestige of A.

If discipline is fractured then,

Weigh crediting of P according to:

Nature of discipline;

Intrinsic plausibility of claim;

The more implausible the more evidence necessary

Plausibility of the explanation.

Reason for rejection other positions

Clarity vs. vagueness;

Reported depth of evidence

Apparent objectivity of A;

Prestige of A

Is the expert's claim being scrutinized by her peers?[8]

The model obviously needs refinement both because the situation is more complicated then the model suggests and because to be useful the model must actually be simpler in its outline. But a few remarks... It should be noted that appeal to authority in disciplines that are fractured and/or without consensus is really quite different than appeals to views supported by discipline consensus. In the former, the layperson must base her judgement much more on her own assessment of the arguments than on the weight of the expert. And of course in these areas no one can claim knowledge, only justified belief. Disciplines themselves may be said to have degrees of credibility.[9]

The implication to teaching in other disciplines

We are far more frequently knowledge consumers than we are producers. Students taking introductory courses in a discipline are unlikely to ever be producers in this area. They should be taught not only the current understandings but also how to be competent consumers of the research in the area (e.g. reputable journals to read, methods of assessment, appropriate size of samples, time usually taken for results to be evaluated and accepted, etc.): basically a discipline-specific sociology of knowledge. Not because this is the "game you play in biology," but because this is the way biological theories and evidence is validated; this is the way knowledge is produced in this field. I read with some interest that Mark Weinstein here at the Institute appears to be trying to get faculty to develop and articulate their disciplines' authoritative structure under the rubric of epistemology.

While I am not saying that epistemology is sociology (and I'm not saying Mark is either), I would certainly want to say that the "authority" structure of a discipline is certainly relevant for assessing claims and for the understanding which claims deserve rational belief. For the non-expert such information may be some of the most relevant information she can possess in assessing an expert's claims.

Summary

In summary, the role of authority in supporting knowledge has been insufficiently articulated both in the discipline of epistemology and in the teaching of Critical Thinking. But because Critical Thinking instruction is directed at giving students guidance in the everyday assessment of claims, it is absolutely crucial that use of authorities and their evaluation be taught. The goal of introductory post-secondary education should be to equip students to be rational "information consumers"--individuals who can think critically about and use intelligently all sorts of claims, but especially those supplied by the intellectual authorities of the culture. Whether it is as a citizen, businessperson, or intellectual, authoritative knowledge constitutes most of a rational person's understanding of the world. The critical thinker must be proficient in such use and evaluation, and understand the delicate art of rational trust, and appropriate scepticism.

End Notes

1. The articles by Walsh, Stitch and Nisbett, Hardwig, and Lehrer, and to some extent the book by Welbourne are the only ones that I have been able to find. Some of the work in philosophy of science outlining the social nature of justification is related. Unfortunately most of this literature is relativistic and contrary to the thrust of this paper.

2. I do not know what Walton means by "subjective knowledge"--though it sounds pejorative.

3. Hamblin, p. 43.

4. There has been an effort to deal with expert conflict by Walton (1987) based on the work on plausible reasoning of N. Rescher. This approach is fairly technical and has not seen implementation in any textbooks. But it, also, is based on the notion of total evidence, though it uses a method for choosing the maximum consistent subset of information. Necessarily this just eliminates one expert's opinion when there is genuine contradiction.

5. I owe most of my understanding of the court's use of scientific information to Imwinkerlried (1987)

6. John Hardwig suggests that the layperson, when confronted with expert disagreement will have to base her decision primarily on ad hominem kinds of considerations because of her inability to assess justifications. There is no question that the assessment of the expert herself (but also the credibilty of the discipline (ad disciplinium?)) is something a layperson should do. Like a judge, the layperson is also wise to attempt to assess the conflicting justifications using whatever evidence she can gather. This is simply an application of the principle of total evidence.

7. I owe this phrase to John Hardwig.

8. Another consideration that is sometimes mentioned in the traditional view, and fits nicely with my own theory, is the issue of publicity. It is reasonable to assume that authorities are much more careful in a situation of peer review because they can be taken to task for incorrectly representing the state of the knowledge and the discipline. Given that what we want is accurate reporting, the conditions of publicity are relevant to weighing the experts claim.

9. Walsh, for example, mentions philosophy's justifed lack of crediblity due to its fractious nature.

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The Anecdote as Evidence

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According to my dictionary an anecdote is "a short narrative concerning an interesting or amusing incident or event" (Random House, p. 50). The breadth of field suggested by this definition perhaps does not bode well for finding a limited area in which to focus interest, but that is as it should be, since this investigation is in its incipient stage. As a form of communication which often entirely escapes the application of any procedures of critical thinking and in fact often entirely escapes mention in logic texts, the anecdote is either no problem to most of us, or it is a problem, and part of its problematicity is that it lurks about unseen (or, better, that it sits out in the open unnoticed). The latter view is the one I shall present and begin to investigate. The greatest part of my evidence will be, of course, anecdotal.

I say that in part to make the point that my concern is not with an explicitly recognized and stated use of anecdotal evidence. Most of us have heard something such as the following said at conferences: "I only have anecdotal evidence for this...," or "at this point my only evidence is anecdotal..." This sort of statement implies that there may be more evidence of a stronger sort, but the speaker doesn't possess it, or that there is no more evidence at present since the methodology or the goal of his study is not yet clear enough to provide it, or that the speaker is allowing for the possibility that his evidence may be contradicted by some future evidence. Certainly there are matters worth discussing with regard to such situations--for instance, when the speaker issues forth a half-hearted disclaimer and proceeds on as if his evidence is anecdotal, but doesn't realize what limitations that might imply. Interesting as these may be, my concern is for the cases which are much more informal and perhaps even mundane, those cases which fill our daily lives but which are never given explicit recognition, because either the speaker and hearer of the anecdote have no hint that anything might be epistemically amiss, or the speaker may be intending some deceit.

Practically conceived, the questions I wish to focus on are such as these: what is the relation between anecdotal evidence and evidence with a clearly greater degree of scientific acceptability? In cases in which we take an anecdote as being stronger evidence than it is, what is there about the anecdote which influences us to do this? I shall very briefly make a few comments with regard to the former, and then concetrate on the latter.

For use in the discussion, I shall relate three anecdotes which someone might possibly use as a basis for belief or action (if no one ever did use anecdotes in this way, there would not be anything to discuss -- but people do, of course). First, a story about the Florida lottery (*Florida Times-Union*, pp. A-1, A-8). The couple who held the $26 million winning ticket came foward and revealed the religious nature of their win. They, at the wife's insistence, had bought $40 worth of tickets instead of the usual $10. The tickets were then stored with a Bible. The husband gave the newspaper his tip on how to win. "Pointing out that the winning ticket had been stored with a Bible, he said: 'I'd advise anybody to say your prayers. You don't win it just picking numbers'"(*Florida Times-Union*, p. A-8). The second story pertains to what is called eye reading. A lady was giving a program to the civic club of which I am a member. Her subject was herbs, since she managed a business in herbs in the town. She also told us that she had heard of a lady in north Georgia who claimed to be able to diagnose all one's ills by closely examining the eyes. She had visited the lady and, to her amazement, the lady successfully told her all the things from which she had been suffering, even though they had never met before, and she had told the lady nothing. What an incredible testimony! Our speaker was so impressed that she since learned the technique herself and was now offering the service at her store. The third anecdote is also about the eyes and a new form of therapy involving exercising the eye muscles by a pattern of focusings and/or movements of the eyes. According to its practitioners, this practice will supposedly slow if not reverse certain forms of vision deterioration. There is an opposing group of eye specialists who hold that this practice is wrongheaded and cannot work, let alone live up to the claims made for it. Rather than expand on these particular cases at this point, I shall use them as reference points in what follows.

Perhaps as these cases were related to you, some specific instances of fallacious thinking were recognizable, and that is as it should be, given that you are an audience with an interest in such things evidenced by your presence, and I wish to stress, given that this is the sort of context in which one is prompted to expect and look for just such things. We are all perhaps a bit more on our toes at a gathering such as this, but this is as much a part of the problem as it is part of the solution, for it would seem that our target population for this renewed emphasis on critical thinking is not ourselves when we are at our best, but those whom we teach (including our families and ourselves) at other times, all the time, when they are at their worst, when they are about to put money into something, or cast a vote, or make a moral decision, or act on a whim, when those practical, real, and important instances of thinking loom off the horizion whether we are ready for them or not. If I give a logic class an example to figure out, to find the fallacy, some of them will of course find it, but there are ordinarily some who will say something to the effect that they know that there is a fallacy but they just can't quite put their finger on which one it is. My point is that it is possible that they only feel that there is something amiss because it is a logic class and something is supposed to be amiss. Out in the real world, as we in academe often say, such a student might not notice a thing and would then be unable to bring his critical powers, such as they are, to bear at all. It is in part for this reason that I think that there may be some value to keeping attention on the anecdeote as such, as a bit of actual life experience which is vibrantly presented to the listener and which will possibly have its effect on him in a way which precludes its analysis into a specific, recognizable fallacy.

I shall return to this point in a moment, but I wish first to discuss what might be called the formal side of the question, the relation between the anecdote and evidence which would be acceptable at a higher, more scientific standard.

We can make some headway on this matter by asking whether it is ever proper to use anecdotal evidence, and I think the rough-and-ready answer to this is clearly yes. To use an anecdote, one could imagine Madam Curie, upon discovering the photographic plate which had been left in the drawer with the pitchblade, formulating possible hypotheses to account for what she found, and soon after, doing some rudimentary further experimentation. Should she have wished to tell anyone her thoughts concerning the relation between the two, she might have realized that at this point her evidence was largely anecdotal--but yet that this was a stage in the routine investigation of what proved to be factual, and a stage which had to be gotten through at that. One can easily imagine other situations in the history of science or current research in which either the amount or level of sophistication of experimentation is such that very little of any reliability could be said. Much of whatever might be said at such a stage would be anecdotal -- a short narrative of an interesting experience.

Certainly appropriate disclaimers ought to be issued along with the available information, but suppose that this doesn't happen in some case. To the extent that any of us is aware that scientific investigations naturally go through this stage, we might take any anecdote as representative of such a stage, and there is the danger. There is even a sort of attractiveness to being in the forefront with regard to some new bit of knowledge. In sports medicine or nutrition, for those of us caught up in the fitness craze, one only has to hear the hint of the latest information, a single success story, to become enthused enough to rush out and buy whatever the new miracle requires. If we didn't see the anecdote as an early sign of a new soon-to-be-generally-accepted truth (or at least close enough to be worth a risk) this response would not seem so natural. Therefore what? Therefore there is a stage in proper scientific investigation of which it can be said that the reporting of results would be anecdotal, and necessary at times for the formation of the next level of hypothesis and strategies of experimentation, but that this limited propriety is a two-edged sword to whatever extent it might lead us to think that some anecdote fit this pattern when it didn't, that after all there is something to this business of eye-reading, and that we could all save ourselves years of the expense of medical examinations...

Irrespective of the stage of the scientific investigation, there is another similarity between an anecdote and a single reported proper scientific observation, which is that in both cases there is an observer noting some event which he subsequently relates to the listener. Now of course what is missing in the ordinary anecdote is the set of safeguards, controls, the rigor of the true experimental situation which allows for its public repeatability. The situation which gives rise to the anecdote most likely has none of these. The two situations are not at all congruent, but yet there remains the fact that there is a bedrock observation of a sort present in each, the sort of observation which can give rise to the expression of such guarantees as, "I don't care what you say; x is true because I've been there, I've seen it." I would guess that this sort of direct obsevational certainty and the anecdotes based on it have always played a large role in the formation of our beliefs, and they profit still more in credibility from this association with scientific observation.

The final point to be mentioned here also takes note that the anecdote may profit in credibility from a similarity. That is, an anecdote might be taken to be an example. I'll give an example of what I take to be an example. There was recently in a science newsletter a story the lead of which concerned a mouse, a particular mouse called N/R40 -243, which had been put on an extended diet of 60% less Purina lab chow that the mice in the control group. The subject mouse's life was lengthened to 54.6 months, far above the national mouse average of 30 months. The article then informed us that similar studies had been done on protozoans, guppies, spiders, water fleas, and rats with similar results (indicating, I suppose, that we would all do better to look like Fred Astaire). Thus the story of N/R40 -243 was shown to be but a single instance of a more general phenomenon -- an example, which was in this case taken for reader interest value and made to stand for the whole set of animals so tested (*Science News*, 1988).

What do examples do? They center a discussion, they concretize it, they give abstract ideas a particular form which for most of us helps to clarify the subject at issue -- while still keeping in touch with the base subject. The profit which the anecdote makes is here, when a story which we hear is not easily identifiable as either one, and we mistakenly assume an anecdote to be carrying the freight of an example. The story will be told as if it were representative of some other, more complete evidence which the storyteller is simply not bothering to tell us, and which is sitting quietly in a reputable journal somewhere on his bookshelves, and we as listeners are free to become its victims if we are not careful. The richness of experience (over the sensuous poverty of bare statistical reports) can be equally present in the anecdote and the example, but enjoying that richness should not blind us to the distinction between the two. The example is representative, a specimen or instance of a wider set, and its value in part depends on the accuracy of this representational relationship. This in not true of the anecdote, the value of which comes from a wide variety of sources depending on the context. To take an anecdote as an example (of anecdoticity), we could use the story of the winners of the Florida lottery. The particular techniques which they used to decide how many tickets to buy and where to store their tickets and how to think of them (praying over them, etc.) were used in the newspaper for their human interest, to help sell the newspaper by making the article more engaging, and not because their techniques represented a mode of lottery behavior which we could all learn and successfully apply.

Those were the formal relations between the anecdote and more acceptable scientific evidence. We can now move on to the informal side, the interaction between the listener and the anecdote as a contexted bit of life experience, the anecdote holistically considered.

Textbook cases are valuable for learning and for practice, for they let us know when to look for a logical mistake and give us instances for purposes of analysis, and even answers sometimes so that we can think through and rethink through what the proper response to the situation should be. But none of these cues and conveniences may be present in the actual situation. To narrow our focus just a little, let us concentrate on situations in which the anecdotalist is personally present--selling us something, convincing us of the truth of something, campaigning for a candidate, lobbying for a bill, trying to get on our good side, doing any of the hundreds of persuasive things which people do. In what ways might his presence have a bearing on the impact of his anecdote? Let's assume that he is a good storyteller. (In an interview some time ago Joanne Woodward came out with the candid and critically wise comment that she was more apt to be swayed by the way a man said something than by what he said, and so she did not endorse political candidates.)

First, if we ever had learned some techniques of critical thinking, the presence of the persuader may lull us into a forgetfulness of those techniques. The person will look a certain way, sound a certain way (have a particular vocal tonality and inflection), perhaps smell a certain way, have a style of movements and gestures, and show certain sobrieties and crazinesses all of which can carry one's attention away from a critical perspective and draw out one's emotional willingness to buy into what is being said.

Second, it is easier in the short run to go along with the anecdotalist. What are our options when we are faced with this situation? We reject the teller's implication out of hand, we accept what he says, or we take some middle position of partial acceptance or rejection with a promise to ourselves that at some future point we will look up that fact or rethink that view. Acceptance or immediate rejection (this taking place when some item in our background knowledge is triggered and we consciously or subconsciously opt to maintain the coherence of what we already have accepted) may be equally easy, and easier than the set of middle positions, all of which call for some expenditure of effort on our part. The examined life may be more worth living, but it is not easier.

Thirdly (this may be a sub-class of ease), if doubt is an irritating state, as Pierce tells us, and if we have a natural tendency to avoid doubt and to settle peaceably into belief when we can, and when someone is personally providing us with ready-made beliefs, we may have a tendency to lean toward acceptance. A good, friendly car salesman tells us, "I've sold these Toyota Corollas to two of my own relatives and they can't believe what good cars they've gotten. One hundred and fifty thousand miles in one case, ninety-five thousand in the other, and never in the shop for a major repair. I'm telling you personally these are good cars. Hey, you're looking to buy a car, what else do you need to know?" Perhaps you need to know plenty more, but if our doubts are in fact eased by this personal testimony, the salesman is well on his way to success.

Fourthly, we have a predisposition to be believers of what we are told, and moreso in a one-to-one situation. (Obviously this is not a universally true observation, but it may characterize enough of us well enough to be worth pointing out.) I have a literary anecdote. In *The Unbearable Lightness of Being*, Kundera's character Tomas goes through an experience which makes this point explicitly. He is visited by a man representing the new Ministry of the Interior of his now-communist country, with whom he does not sympathize. After a while he realizes that, pleasant though the man is, he is both interrogating Tomas and trying to get him to issue a retraction of an article he had once written. Even though he vaguely realizes this, Tomas still has trouble putting aside what the man says. "When you sit face to face with someone who is pleasant, respectful, and polite, you have a hard time reminding yourself that *nothing* he says is true, that *nothing* is sincere"(Kundera, p. 185). After noting that maintaining nonbelief in this situation requires a tremendous effort and training as well, the author suggests that it is a tragicomic fact that our upbringing can be turned against us. We are taught to tell the truth ourselves and to give the people the benefit of the doubt and believe what they say. This emphasis comes from familial, educational, legal, and religious sources. In the case of the anecdote this gives us two things to believe, the literal truth of the story itself, and the truth of its implications as well, which is usually where the heart of the matter is. Further, there is a shift in our attention from the question of the acceptability of the anecdote to the question of basic trust we have in the other person who to all intents and puposes seems to be telling it to you in good faith. I would not go so far as Kundera in describing the problem as one nearly impossible to overcome (since even his own character does overcome it in that scene), but clearly there are situations in which our critical thinking procedures and our basic views of the moral nature of man may come into conflict, and our early teachings and training do not usually give the upper hand to our critical thinking skills.

Fifth, there is at times an anti-intellectual bias with which most of us contend in one way or another. That is, no one wants to be a fouritain of epistemological propriety all the time. Common sense is often seen as superior to an overintellectualized account of the matter, and certainly the anecdote appeals to that element. Theories are just theories, and one can lie with statistics, but a real down-to-earth story of a real experience suffers from neither of these drawbacks. There is a certain attractiveness (for some) to the class clown; there is a certain attractiveness to improvising our way through life by the inspiration of the moment; there is a certain attractiveness to going by feel rather than by thought, and accepting anecdotes rather than stopping to critically analyze them can be seen as an expression of this tendency. If a picture is worth a thousand words, perhaps an amusing and interesting story is worth a thousand statistically sound but somewhat dull words.

Sixth, and related to this last point, one can imagine a situation in which one is confronted by a bewildering amount of information, perhaps technical, to such an extent that one is at a loss as to what to decide or how to act or what to believe. In this situation the anecdote can appear, full of fallacies though it may be, to be a light in the forest, a bit of clarity in all the muddle. Henry Veatch used to tell his students reading Aristotle to interpret the dark parts by means of whatever light parts we could find. That's the principle. Suppose, after filling us with technical specifications of the performance of a whole set of stereos from which we are trying to select one to buy, the salesman adds, "This is the system which I have at home." If we were so little versed in the interpretation of the specs as to be confused beyond hope, we might well take this bit of personal information and say, "Well, that's good enough for me."

Seventh, there is a subspecies of appeal to authority which I shall call appeal to the authority's anecdote. Based on the notion that we expect those in certain positions to have some expertise in their fields, we might grant them a greater leeway in the use of anecdotes (the stereo salesman could function as an example here as well). Since the expert knows about the area, it would only be natural for such a person to have some relevant anecdotes at his fingertips which could guide us along the right path.

Eighth, and last, we may not know any better than to do as we have been doing and believe most of what we're told. If no hint of the procedures of critical thinking have been in our background, we certainly can't use them. There must be some acquaintance with the notion of an improved manner of thinking as different from the natural manner of thinking. If one is, for instance, the child of a domineering parent who made his opinions and stories into household law one may be starting out several steps behind the others in the search for sensible opinions. There is an academic counterpart to this--I on occasion will hear a student telling of reading Descartes, and agreeing with him; then reading Hume, and agreeing with him; and next trying Kant, and not being able to argue with him, either. If one has no background, then the dominant position is likely to be the one being read or heard at the time. To break out of this pattern some set of tools of critical thinking and some practice is clearly required.

To conclude, let me point out that I am aware that I have not proposed solutions for the question of what to do about anecdotal evidence, I have only tried to trace why we might in our worst moments give the anecdote more than its evidential due. Solutions remain a project for the future. However, as a nod in that direction, I'll leave you with two favorite quotes: from Bertrand Russell, "What we need is not the will to believe, but the wish to find out..."(in Christian, p.28) and from Voltaire, "Doubt is a disagreeable state, but certainty is a ridiculous one" (in Christian, p.30).

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Q: How Is A Logical Fallacy Like A Grammatical Error? A: For All Intensive Purposes, Thier The Same Exact Thing.

William R. Brown

A comparison of the grammatical error and the logical fallacy may reveal something significant about the student, who enters our classes already thinking and writing in some fashion. (I am considering fallacy, of course, as mistake in reasoning rather than stratagem of deception.) I have to assume that you accept as more than a mere analogy my claim that there is a real relation between the way people acquire language and the way they acquire the ability to reason.

To prevent two possible false expectations, let me explain first, that I am not going to compare the usage glossary of a Freshman-English text with a list of fallacies from a Critical-Thinking text. Not only does no particular grammatical error necessarily resemble any particular logical fallacy, but indeed so called "correct usage" is about the only aspect of language I can think of that has no counterpart in reasoning. Second, I am not going to adopt as my text George Orwell's often quoted statement that "if thought corrupts language, language can also corrupt thought" (353).

Without denying that there can be an interplay between poor writing and poor thinking, I want to avoid assumptions about the supposed decline of a language or of the public's reasoning abilities from some past golden age of purity to the corruption of the present. I want to focus on certain unchanging aspects of language and reasoning.

I am going to argue that the distinction between competence and performance, as defined in Transformational Generative Linguistics, can be applied as well to the commission of logical fallacies as to the commission of grammatical errors. Linguistic competence is the knowledge of a finite set of rules of language native speakers have that enables them to produce an infinite number of sentences. Children acquire by far the greatest number of these rules by some natural means before they enter school, as shown by the obvious facts that children are speaking the language before they begin school and that language itself originated long before schools did. All this is not to say that all speakers become equally competent, that there is no variation in the rules learned by different speakers, or above all that speakers will never make mistakes. Mistakes that are properly called performance errors will, once they are called to attention, be acknowledged as mistakes. No such acknowlegment will take place if the person has learned a rule imperfectly or not at all or has learned a nonstandard rule. The following sentence is a good example of a performance error:

> 1) The more difficult the vocabulary is the harder the time the reader will have difficulting understanding the point the writer is trying to get across.

It is obvious that the writer of this sentence has already half corrected it by substituing the word *understanding* for the non-word *difficulting* and has made a second mistake by failing to erase *difficulting*. On the other hand, a person who has never acquired competence in the past-perfect tense either will not produce any past-perfect sentences or else will use this tense in random variation with the simple past and will not clearly grasp a distinction intended by other speakers and writers who are competent in it.

I want to quote a passage from a seventeenth-century logic book that applies to reasoning I think the same distinction that twentieth-century linguists apply to language:

"These operations [that is, apprehension, judgment, discourse, and disposition, or the categories of reasoning] proceed merely from Nature, and that sometimes more perfectly from those, that are altogether ignorant of the Art of Thinking, than from others that have learned it. So that it is not the business of this Art to find out the way to perform these Operations, for that we have from Nature alone, that has given us the use of Reason, but rather to make certain Animadversions upon those things which Nature herself operates in us, which may be of a threefold .....use to us and [one of the three is] that thereby we more easily detect and explain the Errors and Defects which we meet with in the Operations of the Mind..."

(Arnauld and Nicole 26)[1]

This passage is taken from the Port Royal *Art of Thinking* (*La Logique: ou L'Art de Penser*) a work which shared one co-author with the Port Royal *Grammar (Grammaire Generale et Raissonnee)*. Noam Chomsky made the *Grammar* a cause celebre in his 1966 book *Cartesian Linguistics*, in which he argued for a parallel between this seventeenth-century text and his own linguistic theory. I think the pasage from the *Art of Thinking* makes a more explicit statement of the same point than what Chomsky cited from the *Grammar*: it is not the purpose of a logic book to teach people how to think, any more than it is the purpose of a grammar book to teach people how to speak, but rather " to make animadversions upon those things which Nature operates in us... that thereby we more easily detect and explain errors." After all, people were also reasoning, just as they were speaking languages, long before there were books or schools.

Now let me cite a few sentence examples from student writing and try to apply the previous elementary theoretical statements to them. Consider this sentence:

> 2) Mary Grace had a feeling of discourse towards Mrs. Turpin's personality struck Mary Grace the wrong way.

This sentence strikes one as nonsensical, but only two words are needed to convert it into normal English. Changing *discourse* to *disgust* and adding the word *which*, plus a comma, we have:

> Mary Grace had a feeling of disgust towards Mrs. Turpin's personality, which struck Mary Grace the wrong way.

The omission of a word is a typical performance error. As to competence, it is likely that the writer knew what the word *disgust* means and did not know what *discourse* means --or even clearly recognize it as a word distinct from *disgust*. Just so, another student, when asked on a test to use the word *solidarity* in a sentence, wrote:

> 3) The man on the mountain has lived in complete solidarity for ten years; no one remembers what he looks like.

Vocabulary on an academic level is probably the greatest competence deficiency college students have.

Consider this:

> 4) The story itself prevails a simple mindedness, unaffected by the shadow of doubt, a divine innocence, courage and malice which have lost itself in the unconscious depth of mania. The very mystery of iniquity. Here in this work of art, these opposites meet and find their destiny.

This reminds one of Lewis Carroll's famous poem "Jabberwocky," an instance of more or less syntactically correct gibberish. There is a simple explanation of the problem: the student was attempting to copy, paraphrase, or summarize a published passage of literary criticism that she no more understood than she would have if it had been written in Japanese. The lack of competence in academic English is shown by the gibberish, and the possesion of competence in ordinary English is shown by the mostly correct syntax. The only glaring grammatical error, "which have lost itself," reflects the fact that the student has blended what was supposed to be a contrast between the two characters Billy Budd and Mr. Claggart into a singular conglomeration.

The following sentence is just the opposite. Its intended sense can be guessed at even though it may well be the most syntactically distorted sentence I have ever found in a student paper:

> 5) The way which depicted the state in which the mouse was in when caught was the climax of any trace of the loser's existence at the New Yorker had been removed.

The example seems to defy analysis, but speculations on bizarre competence deficiences the writer may have should be viewed very carefully in light of the fact that the rest of the paper from which it was taken was written in more or less normal English.

These linguistic examples contain a wide range of complications, but what is perhaps most remarkable about them is the degree to which underlying competence is revealed in spite of the most extreme distortions and inadequacies. In order to compare logical errors with linguistic ones, I have selected examples of contradiction, such being perhaps the most extreme.

I refuse to believe that there are college students who do not understand the principle of contradiction. Very young children have already acquired competence in this area by experiencing the unkept promises and unenforced rules of their parents. Still, in explaining how to persuade a listener, a college student writes:

> If that does not work, walk away and keep trying.

And in describing an experience of insomnia, another writes:

> Sleep was just something to dream about.

To take a more developed example, consider the following:

> 6) But we can safely say that the way the student has been raised and treated will almost identically resemble the way the student will bring up his or her family...The decision to have children is probably the most influenced by the parents. The decision when is even more influenced by the parents.

Obviously, even though we may legitimately say that people whose parents were child abusers are more likely to become child abusers themselves than are people whose parents were not child abusers, we may NOT say that people whose parents had children are more likely to have children themselves than are people whose parents did not have children. But incredibly, when I use this example in class, usually no one immediately understands that something is wrong. There is always a flash of insight from somebody halfway through my explantion, but there are always those who still look blank after the entire explanation has been given. The real problem here is not contradiction but induction. Many students do not understand the function of a control group; that is why it does not occur to them that the control group in this case would have to consist of a nonexistent set of people. It may have been the same problem that caused another student to write, in describing a utopia:

> 7) The majority of those who eventually die are terminally ill and are buried by death of natural causes.

Apparently, this writer never understood what was wrong; after receiving my marginal note, she resubmitted the sentence unchanged. But in this case, whether the problem was linguistic or logical may be hard to tell.

You may recall that I mentioned the possibility of different speakers learning different language rules. What are the implications of that possibility, and do different thinkers also learn different logic rules? To use myself as an example, I have an idiosyncratic language rule that says the word *prevent* cannot be followed by a reference to a human in such a way as to say:

8) Prevent the baserunner from scoring.

Instead, one has to say, "keep the baserunner from scoring" or else, "prevent a score by the baserunner." I have no idea how I acquired this strange rule, which keeps me from accepting or saying something everybody else accepts as normal. On the other hand, the system of verb conjugations in Black English Vernacular differs from Standard English in such ways as to have important social consequences, and a sizable minority of speakers (twenty-six percent according to my own unpublished study) understand the word *unless* in such a way as to produce interpretations of certain sentences that in truth are functionally different from majority interpretations. It is well known that people do learn deviant rules of formal logic, Affirming the Consequent being one of them. At this point, the important issue of correctness arises: it may seem that, on the one hand, language diversity is acceptable, that people have a right to their own dialect, while on the other hand, the rules of logic are eternal and universal and any deviation from them is simply wrong. Well, even though there are language universals and even though there are different logics, I have to admit that the rules of logic do seem to have a kind of stringency that rules of language lack. Presumably, Modus Ponens and Modus Tollens really are just as valid on the planet Vulcan as they are on Earth. However, when it comes to the acquisition and employment of rules by people, this difference of stringency might not make as much difference as one might think. Let me explain. Normally, people do not directly challenge rules of logic any more than they challenge rules of mathematics when they miss problems on a math test. People who affirm the consequent are not rejecting Modus Ponens and Modus Tollens and proposing to replace them with a different rule. They still use the legitimate rules in other contexts. But when the standard rules fail to prove the desired conclusion, they supplement them with an illicit corollary that will do the trick. The same is often true in language. Consider the following sentence:

9) Permisson for and who can travel abroad is closely scutinized
in Russia.

There is a standard transformation that could produce the following sentence:

> Eligibility and permission for travel abroad are closely scrutinized in Russia.

from the underlying structure

> Eligibility for travel abroad and permission for travel abroad are closely scrutinized in Russia.

But this transformation could not produce the sentence that one of my students wrote and several others approved as grammatical in a class discussion. The attested sentence lacks the most basic of all conditions necessary for this transformation--namely, that there be two iterations of the same noun phrase in deep structure. In this case, one instance of the word *travel* was a noun and the other was a verb! The sentence produced seems to be based on identity of pronunciation and spelling rather than identity of grammatical category and thus to present a counterexample to axiomatic principles of linguistic theory. Still, the writer would have used the same transformation correctly in some other context not requiring the word *eligibility*, a word the writer may have seldom seen, heard, or used outside the context of having grades high enough to participate in athletics. Similarly, the student who wrote

> 10) The new buses add to the conditions of being uncomfortable.

may have generalized the word *discomfort* inadequately or not at all beyond the context of something to be relieved by drug products advertized on television. All in all, the distortion of standard rules, which the student normally uses correctly, in a vain attempt to save an argument or a sentence that is not working out right may account for more ungrammatical and illogical productions than does the learning of deviant rules.

I think I have done as much as I can do to establish my point that, when a student produces some grammatically or logically horrendous statement, the explantion is usually something other than the possibility that the student has never learned the particular grammatical or logical principle that appears to have been violated. It follows that teaching the student more grammar and more logic, though I believe it is valuable for other purposes, is not the answer for correcting and preventing errors. The answer is to reconstruct the framework in which the error was produced, preferably in dialogue with the student.

One final pair of examples may illustrate how this can work. Someone wrote:

> 11) It has become an accepted part of life that everyone has the right to a difference of opinion. No one has the right to judge who's morals are right and who's are wrong.

Aside from containing the commonly held attitude that any opinion is as good as any other because only facts matter, this statement makes the interesting assertion that you have a right to your opinion, but if your opinion is that somebody else's opinion is right or wrong, you don't have a right to your opinion. Instead of merely marvelling at this contradiction, let's try to construct a world in which the statement makes the maximum possible amount of sense and assume that that world is the one in which the writer is living. First of all, it has to be a world in which morals are totally private and never to be discussed, for if you ever discussed them, you might find that you disagreed and that you had to judge the other person's morals to be wrong. That's why religion and politics are sometimes said not to be proper topics for polite conversation. In the world under consideration, it is socially unacceptable to disagree openly with anyone. Second, it is a world in which criminals and other classes of people whose behavior you disapprove of very strongly, in some cases perhaps strongly enough to have them executed, are believed not to have any morals at all, either good or bad. That's why, when society punishes these people, society is not judging anyone's morals to be wrong. Such a world, I suggest, is the one the students in the ethics classes that some of you may teach really are living in. But it is not a world in which people believe in the contradiction that everybody has a right that nobody has. Through this analysis we have gotten rid of the pseudoproblem in logic that was obscuring the underlying problem in ethics.

The foregoing quotation was taken from a written debate in which the writer was attacking another student's proposal that instruction in morals be given in the public schools. That other student replied as follows:

> 12) If a child is brought up in a certain way, that child will live with these taught morals throughout their lives. In my proposal I do not feel that I am asking one to judge right from wrong. What I am simply proposing is that if a child is taught high moral qualities at a young age he will grow up with these high moral qualities.

Here we have a contradiction in reply to a contradiction: I'm not saying anybody should judge right from wrong, I'm just saying somebody (in this case the teacher) should judge right from wrong. While marking the papers, I had a feeling that this student really did believe in moral absolutes and just feared it would be socially unacceptable to say so, since she realized her peers were moral relativists. In a subsequent class discussion, the student confirmed this interpretation.

Perhaps I have created an impression of optimism in that I have represented students as being far less incompetent in their thinking and use of language than they are usually believed to be. That's because I have tried to limit my discussion to these two issues. If I were to allow myself to deal with other abilities that might be expected of students, such as the ability to analyze and evaluate their own thinking or anybody else's--that is, to think ABOUT thinking--or even so much as to read the writing of others, I assure you I would be able to generate enough gloom and doom to satisfy any pessimist in the audience. But I hope it has been worthwhile at least to try to distinguish real problems from pseudoproblems.

NOTES

[1] For a more recent and more readily available translation than the one I have used see Dickoff and James.

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Critical Thinking and Inquiry

Informal logic deals with arguments; arguments are frequently significant only within the context of larger inquiry. Critical thinking looks to these large forums for understanding and attempts to determine the criteria that determine the appropriateness of particular inquiries and inquiry in general. In the two papers representing such concerns, we see examples of the attempt to make sense of inquiry in two different ways. William Murnion attempts to offer a general characterization of two of the most essential kinds of argument in inquiry. Gordon Whitney, in contrast, asks for a reevaluation of how inquiry is to be understood and looks to the specifics of particlar exemplifications upon which evaluations are to be based.

The first paper, by William E. Murnion, *The Complementarity of Induction and Deduction in the Process of Inquiry,* offers an analysis of the function of deduction and induction in the process of inquiry in order to "break the deadlock created by the reductive analysis of the procedures in terms of logical form." Analyzing induction and deduction on an *a posteriori* basis, Murnion shows that both procedures are necessary and share a complex logical form that is not obvious on the standard account. Offering an account that identifies induction with the role of "generating and explicating the meaning of hypotheses," and deduction with the task of "testing the realism of hypotheses and reducing them to the framework of systematic theory," Murnion argues that they perform "specific and complementary functions in the self-corrective process of learning." Murnion's paper moves away from the most abstract characterization of argument types and towards the function of argument within the context of its application.

The second paper, *On the Analogy Between Kuhn's 'Normal Science' and 'Critical Thinking': A Quest for a Useful Canon of Texts* by Gordon E. Whitney, seeks to turn critical thinking towards the identification and analysis of crucial exemplifications of thinking in various domains. Whitney argues that Kuhn's concept of "Normal Science" provides a pattern useful for the critical thinking movement. He argues that rather than relying on "an encyclopedia of fallacies," critical thinking should attempt to find "for each distinct problem-type a content-specific controlling paradigm." He argues that progress in critical thinking "hinges on identifying and analyzing shared canons of texts." He offers a number of "well-contained problems for use as models" that would enable critical thinkers to ground "normal analysis" in the various fields represented' and also serve to identify "significant milestones and anomalies."

The Complementarity of Induction and Deduction in the Process of Inquiry

William E. Murnion

The meaning of induction and deduction and the relationship between the two remain a matter of controversy.[1] The conventional approach has been to make a reductive (*a priori*) analysis of these procedures, in terms of the potential approximation of either procedure to the demands of a formal system. But the result has been to conclude that while both procedures may be necessary in practice, neither is valid in theory. For if knowledge has no form but deductive inference, deduction must be necessary for knowledge, but it cannot be valid if a formal proof of validity would lead to an infinite regress and if the use of deduction to gain knowledge entails a fallacy: begging the question in the case of syllogism;[2] positing the consequent in the case of a conditional argument.[3] And if deduction has no content but what is supplied by induction, induction must also be necessary for knowledge, but neither can it be valid if the form of inference is deductive, a predicament which would make induction either an inferior form of deduction -- statistical and probabilistic, as opposed to normative and necessary -- or else an informal process with no logical validity at all.[4] Thus the reductive analysis of induction and deduction has led to the dilemma of having to use these procedures without justification in order to reason at all or else having to reject them at the price of giving up reasoning.[5]

The way through the horns of this dilemma is to take a different approach altogether: to analyze these procedures constructively (*posteriori*), in terms of the respective function of each in the process of inquiry. On this analysis, both procedures may be recognized as valid if the form of inferences can, in either case, be a conditional but not necessarily a deductive argument. Each procedure can also be regarded as necessary for inquiry if it performs a specific function: induction, to generate and explicate hypotheses; deduction, to test hypotheses and reduce them to the framework of theory. And both together can be accepted as sufficient for the completion of inquiry if the fuctions they perform consitute a self-corrective process of learning.[6]

An analysis of this kind would preserve the function of induction to supply the content of knowledge, without denying to induction logical validity, while it would restrict to deduction the testing and coordination of hypotheses, without denying to deduction a role in the increase of knowledge. Let us attempt to reconstruct, therefore, the form of inference and then the functions of, first, induction and, second, deduction.

1. *The Form of Inference*

The form of inference is something I am going to have to stipulate here in a set of assumptions conforming to the conventional rules of inference but amplified to include the relation of inference to insight.[7]

(1) The simplest form of inference is a conditional argument, *modus ponens* .[8]

$$\begin{array}{l} p \dashrightarrow q \\ \underline{p\quad\;\;} \\ q \end{array}$$

(2) This form becomes more complex insofar as (2.1) it expands to include the *modus tollens* and (2.2) is taken to imply analysis as well as synthesis. The expansion to include the *modus tollens* can be indicated diagramatically.[9]

$$\begin{array}{c} p \dashrightarrow q \\ \underline{+p \vee -q} \\ +q \vee -p \end{array}$$

The implication that the form stands for analysis as well as synthesis is evident from the fact that the argument can be read in two ways. Clearly, it can be read synthetically (as justification), proceeding from the statement of the conditional in the major, through the positing of the antecedent or the negating of the consequent in the minor, to the congruent affirmation of the consequent or denial of the antecedent in the conclusion. But it can also be read analytically (as explanation), by taking the conclusion as a claim, either positive or negative, for which the appropriate reason is presented in the minor and the presupposition for the appositeness of the reason in the major.

3) The form becomes still more complex when it is expanded to include a recognition of the implications for the soundness of an argument of the possible truth values of the elements of the propositional forms.

$$\begin{array}{c} p \dashleftarrow\dashrightarrow q \\ \underline{+p \;\vee\; -q} \\ +q \;\vee\; -p \end{array}$$

$$\begin{array}{lcl} +p+q & \qquad\qquad & -q-p \\ +p-q & & -q+p \end{array}$$

Though the affirmation of p logically implies the affirmation of q, it may or may not be the case that q actually is as it is supposed to be. And though the denial of q logically implies the denial of p, it may or may not be the case that p actually is as it is supposed to be. Thus the validity of a claim/conclusion depends upon its conformity to the rules of a conditional argument, but the truth of a claim/conclusion depends, first, upon the truth of the reason (p or not-q) alleged for it in the minor of the argument and, second, upon whether or not p and q are conjoined in reality as they are supposed to be in thought. And when both validity and truth are taken into consideration, it becomes evident that the major premise of an argument must be a biconditional precluding the truthfulness of any existential state but the *modus ponens* (+p+q) and the *modus tollens* (-q-p).

4) The form of inference is complemented by the informality of insight. For there would be no substance to an argument, nor any perception of the nexus between the premises and the conclusion, without an insight into the nature or function of something. Nor, on the other hand, would there be any rational communication about a putative intuition into the nature or function of something without the formulation of an argument in which the reasons for an assertion are posited in the minor premise and the linkage between the reason and the assertion articulated in the major premise. Thus, the form of inference pivots around an insight centered in the minor premise of an argument.[10]

The plausibility of this set of assumptions rests, therefore, upon its conformity (in numbers one to three) to the conventional rules of inference and (in number four) the intuitive necessity of understanding for either the generation or the comprehension of the meaning of an argument. Although the rules of inference have been devised on the assumption that they are strictly applicable only to deductive argumentation, that is not a necessary assumption, especially since it is also conventionally assumed that induction can be recognized as a valid mode of argumentation only if it conforms to the rules of inference. And, although it is also conventionally assumed that intuition and inference are, by definition, contradictory,[11] that need not be so if the intuition in question is a *justifiable* immediate apprehension and the inference to which it corresponds has initially the *informality* of a rational assertion.[12] Given these assumptions, what remains to be seen is how the form of inference functions in induction as well as deduction.

2. The Inductive Phase of Inquiry

In induction we use experience to predict the future. We act on the presumption that an infinitesimal set of actual events (the short run) is typical of a potentially infinite course of events (the long run) insofar as it suggests an association that leads us to expect the same kind of associations to obtain whenever the same kind of events occur. Objectively, this association is supposed to be neither merely coincidental nor yet metaphysically necessary, but something factually (physically or historically) necessary, given the actual nature of this world. Subjectively, it is assumed to be neither empirically obvious nor self-evidently true, but something probably justifiable, and not just in terms of its survival value, its inevitability, or its apparent success. Interpreting induction as a form of inference with the function of grasping the meaning of a phenomenon from the evidence of its signs provides such a justification (table 1).

The Form of Inference: Inductive Function

When/where and only when/where these signs occur, this object may be present

And the signs do occur.	OR	And the object is not present.
:.The object may be present.		:.The signs of it will not occur.

Verification

Positive: Confirmation	Negative: Corroboration
The object is present.	There are no signs of the object.
:.These are (sometimes) signs of the object.	:.These are (the only) signs of the object.

Confirmation plus Corroboration

If the object is present, these will be the signs of it.

OR

Falsification

Positive: Exception	Negative: Addition
But the object is not present.	But there are (other) signs of the object.
:.These are not (always) signs of the object.	:.These are not (the only) signs of the object.

Exception plus Addition:

If the object is present, there will be other signs of it.

The supposition is that when and where and only when and where a certain set of signs occurs the phenomenon in question is present. Thus the expectation is that if the signs occur the object will be present and if the object is absent so will the signs be. But the logic of these expectations has to be confronted by what happens in reality. The object may not be there even if there are what have been taken to be the signs of it, just as what have been taken to be these signs may also show up even if the object itself is not present. But if things turn out as we have come to expect -- and the object is there whenever and wherever we see what we have taken to be the signs of it and, likewise, the signs are missing whenever and wherever the object is absent -- we hypothesize that if the object is indeed present, then we will see what we have taken to be the signs of it.

Induction, on this interpretation, has the function of restoring an understanding of the relationship of an object to its background. It originates from a question about an apparent anomaly in the behavior of an object and terminates only when it has "saved the appearances" by modifying the idea of the object or reinterpreting the significance of the background until the two seem to fit together once again. Thus the function of induction is to generate a hypothesis plausible enough to test through deduction for its realism.

To generate the hypothesis, though, both insight and inference have to come into play. In induction, the first phase of inference is analysis: the formulation of a hypothesis from an insight into empirical data. This phase moves from the random events of experience; through a claim, for which a reason is alleged in what will become the minor premise of an argument; to a plausible presupposition, in what will become the major, for the linkage of the alleged reason to the claim. This is the procedure to which, minus any reference to the need for insight, Bacon gave the name simply of induction.[13] Pierce, however, recognized the necessity for integrating insight with inference in this procedure and of distinguishing it, as abduction or retroduction, from the synthetic phase of induction.[14]

The necessity for insight is obvious because, while the material for this phase of induction is supplied by empirical data, there is no possibility of the data simply crystallizing spontaneoulsy into a plausible hypothesis. Hume was right in this respect: a constant (or, I might add, a remarkable) conjuction of facts is simply a contingent and indeed imperceptible phenomenon without the help of imagination to discover a pattern in the data.[15] Insight at this stage of the process is the grasp of an imaginable rationale for whatever anomaly in the perception of an object has precipitated an investigation.[16] Without benefit of hypothesis, imagination has to rely upon whatever it can find--association, analogies, homologies; traces, symptoms, fragments--to discover a model within which to gain an insight into the significance of the anomaly. Its task is accomplished if we can infer from the model a hypothesis about the conditions necessary for the occurrence of the object it depicts.

This hypothesis we formulate as the major premise of a conditional argument. We conceive of the concrete possibility that only whenever and wherever certain signs appear will the object in question be present. The factual character of the law is evident from the fact that while the major is indeed a positive biconditional, the verbs in both clauses are in the indicative mood. It represents a belief that under the circumstances, all things considered, the object or event can be expected to occur when and where certain conditions are fulfilled, and not otherwise. The implications of this hypothesis are what remain to be understood in the complementary -- and synthetic -- phase of induction.

Abduction (as we shall call it) is, therefore, the analytical movement by which induction leads from the actual confines of our comparatively infinitesimal experience, through an insight into the possibilities suggested by a model of the information at our disposal, to the conception of a hypothetical general law for an infinity of similar cases.

In the complementary movement of synthesis, which we shall call adduction, we draw out all and only the logical implications of the hypothesis and subject these implications to factual confirmation. This is the procedure some methodologists refer to as informal reasoning or critical thinking. More generally, though, it is what contemporary logicians, without any allusion whatsoever to insight, commonly call induction, by which they mean a kind of concrete (or nondemonstrative) inference, in contrast to the formal (or demonstrative) inference of deduction. In recognition, however, of the fact that this movement is not the whole of induction, but simply the synthetic counterpart to the analytic movement of abduction, we shall call it, by contrast, adduction (a designation for when there is also some precedent).

In adduction the function of insight is, logically, to derive from the hypothesis in the major presmise the lineaments of a prototype capable of suggesting all and only the conclusions implicit in it and, existentially, to fit the prototype to samples, examples, or paradigm cases of the object under investigation. Since insight seeks to develop clear and precise criteria for distinguishing between any and all signs of the presence as opposed to the absence of the object, the need is for an image in which random, coincidental, or marginal aspects of the object are discounted or rounded off to leave its salient features in high relief. In this phase of induction, therefore, insight is supposed to supply the basis for asserting in the minor of an argument whether or not the conditions have actually been fulfilled that were postulated in the major as necessary for the conclusion to follow.

Adduction, then, is the phase of induction which moves from a grasp in the major of the necessary conditions for the occurrence of an event or the presence of an object, through an insight into a prototype of the event or object in which these conditions are (logically or existentially) fulfilled, to a conclusion about the consequent occurrence of the event or the presence of the object.

For the conclusion to be objective as well as logical, though, it must be confirmed by events. The phenomenon must turn out to be present when the hypothesized signs appear and absent when none of these signs are apparent before the nexus the phenomenon is supposed to have with these signs can be deemed to be objective. Should that occur, the necessity for using the signs to catch sight of the object will appear to derive from the necessity for the object to be present for the signs to be produced. In that case, there will be grounds to investigate in the deductive phase of reasoning the hypothesis that the object is the cause and the signs its effects.

The obvious employment of testing occurs, therefore, in adduction, the synthetic phase of induction, when the implications of a precise and specific hypothesis have to be confronted with direct observations. But the observations may falsify as well as verify the hypothesis, and the outcome, in either case, may be positive or negative. But just as testing is the terminus of each movement of adduction, it is also the origin of each movement of abduction. Clearly, this is the case in the oscillation between the specifications of a hypothesis and the details of its concrete implications.[17] Yet it is also from the random and casual observations of everyday experience that the first intimations arise of the anomaly from which an investigation originates. Hence, while methodical and deliberate testing is a feature of adduction, testing, in the broader sence of an active concern for the objectivity of ideas, is a component of both phases of induction, of abduction as well as of adduction.

In both phases of induction there is a bias in testing toward verification rather than falsification. Since the function of induction is to generate hypotheses to be tested in deduction, confirmation and corroboration are the anticipated results of the process. Due regard must be paid, of course, to the possiblility of falsification, whether it produces exceptions or additions to the rule, for it has the value of eliminating worthless hypotheses. But since deduction has, in any case, the critical function of testing the realism of every hypothesis, we can afford to be open-minded in induction about potential hypotheses. Too critical an attitude in induction would deprive us of enough viable hypotheses to subject to the rigors of deduction.

At any rate, testing in induction is a complex and difficult process. To mitigate the complexity, philosophers have suggested sets of rules, methods, or canons for establishing definitively whether purported signs of an object or event are actually the effects it produces.[18] Helpful as they may be, these formulas amount to intuitive assessments of the various combinations of sets of results. They cannot substitute logically for ringing the changes on all the possible combinations before arriving at a considered judgment. More importantly, they cannot make the infinitesimal evidence gathered from any short run of actual events approximate, except asymptotically in theory and pragmatically in practice, the infinite possibilities of the long run of all events. Induction remains in the end induction.

3. The Deductive Phase of Inquiry

To determine the realism of a hypothesis, therefore, and to integrate it into the framework of theory, it is necessary to complement induction with deduction. For deduction enables us to develop and use theory both for speculating about the necessary implications of hypotheses and for integrating hypotheses into a universal framework.

In deduction we act on the presumption that by defining our terms more precisely and reducing the definitions to a system we can at once expand and certify our knowledge of the world. If the definition of an object does not lead to the discovery of hitherto unknown and otherwise unforeseen properties and functions of the object, we presume it must be a nominal and not an explanatory definition: merely the summation of available information about an object, but not an authentic interpretation of its nature. We also assume that if we cannot incorporate the definition of an object into a unique and formal system for the field of study of which it is a part -- and, ultimately, into a unique and formal system for all fields of study -- either the definition may be merely an ad hoc rationalization or the field lacks a proper rational foundation. Hence, deduction expresses the expectation that if knowledge cannot be a reproduction of nature, it must be more than just a saving of the appearances; it must amount -- ultimately and ideally, though perhaps not immediately or concretely -- to a rational explanation of the world. Interpreting deduction as a phase in the self-corrective process of learning, a phase with the same structure as induction but a different function, corresponds to this conception of its nature (table 2).

The Form of Inference: Deductive Function

If and only if such were the nature of the object would the only these be its effects.

And such is its nature	OR	And these effects do not follow
:.These effects must follow.		:.Such cannot be the nature of the object.

Verification

Positive: Demonstration	Negative: Exclusion
The effects do follow.	This is not the nature of the object.
:.This object must be the (necessary and sufficient) cause of these effects.	:.This object cannot be a (necessary) cause of these effects.

Demonstration plus Exclusion
If these effects occur, this object must be the cause.

OR
Falsification

Positive: Refutation	Negative: Alternation
But the effects do not follow.	But this is the nature of the object.
:.This object cannot be a (sufficient) cause of these effects.	:.This object must be the cause of other effects.

Refutation plus Alternation
If these effects occur, this object need not be the cause.

The supposition is that if and only if the nature or function of an object is as we have defined it to be can it produce all of and only a certain range of effects. We expect, therefore, that if the object occurs or we can make it occur exactly as we understand it to be, then the effects we postulate -- eventually all of the ones and only the ones we postulate as such -- must follow, or, alternatively, if the postulated effects do not occcur or can be excluded, then the object cannot have the nature or function we predicate of it. But we have to check to see if things are as we expect them to be. For the results of an experiment may be the opposite of what we expect: the effects we predict may not follow even if the object, as far as we can tell, is present, or the object may, as far as we can tell, still be present even if its effects are unpredicted. But if we have defined the object correctly and designed the experiment properly, the results will be just as we predicted: the subject(s) of the experiment will show the predictable effects of the object in question, and the control group, which shows no sign of the effects, will be the one from which, as far as we can tell, the object in question is absent or was excluded. In that case, we shall be entitled to conclude that if the predicted effects occur, it is the object in question that is the cause.

Deduction, on this interpretation, has an ontological function. It explicates the meaning and establishes the truth of a counterfactual conditional. Whereas the verbs in the major of an inductive argument are in the indicative mood, the better to correspond to the factual probability of an empirical hypothesis, the verbs in the major in a deductive argument are in the subjunctive mood, the better to denote the logical necessity of a normative theory. The logic of induction does indeed have a formal necessity to it, but the logic of deduction implies a substantive necessity as well. To deduction belongs the imperative rigor of modal argumentation. The conditional in the major of a deductive argument implies not only that we cannot but think of an object in a certain way but that the object itself cannot exist except as we conceive of it. To substantiate this supposition, we first infer and test its most radical implications until no genuine doubt remains about its correspondence to the facts, and then we reflect upon its presuppositions until we are satisfied they could fit without gap or remainder into the adamantine structure of a grand unified theory.

To accomplish this coaxial task, insight is as necessary in deduction as in induction. But now the function of insight is changed to conform to the reversal in deductive inference of the sequence of analysis and synthesis. In deduction, the first phase of inference is synthetic rather than analytic since deduction begins with a hypothesis supplied by induction. But in deduction the hypothesis is converted from a factual into a counterfactual conditional--from a supposition that if a particular object is present the effects taken to be its signs occur to an assumption that if and only if the nature of the object were as it is supposed to be could it cause certain and only certain effects. For induction follows the order by which we learn about something from its manifestations, whereas deductuion serves to reconstruct in thought what we believe to be the order by which the thing produces these manifestations of itself in reality. Deduction has the task, therefore, of substantiating not just the conditions for an object to be conceivable but for it to be possible. Hence, its function is to formulate the theories capable of explaining what are otherwise supposed to be contrary-to-fact events and to eliminate any theory contradicted by events supposed otherwise to be inexplicable.

In this synthetic procedure, which we may call eduction, the function of insight is to devise the basis for an operational definition of the object to serve as the minor of the argument. Before there can be any test of the counterfactual conditional in the major, there must be a precise and adequate statement of the concrete significance of the postulated condition in the antecendent of the premise. And for this to occur there must be some icon of the object in which the condition can be perceived. In the physical sciences, this is supplied by a test case or a crucial experiment; in the social sciences, by the parameters for a double-blind test, a random sample, and/or a control group. Mathematics requires an imaginary counterpart to an equation. Philosophy needs a figure (like those in Norwood Hanson's *Patterns of Discovery* or Herbert Simon's *Models of Discovery*), a form (like Carl Hempel's "covering-law" model or Bernard Lonergan's "form of inference"), a table (like the ones in this paper), or a metaphor (like Kuhn's use of "revolution" and "paradigm") to provide a graphic representation of a theory. Whatever the icon may be, its function is to enable someone to "see" what a theory means.

By explicating the full scope and precise significance of a counterfactual conditional, eduction is supposed to enable a definitive test of whether or not the reason for an alleged association between a set of data and the object in question is that the object is indeed the cause of the data. The conclusion of the eductive phase of deduction is, therefore, an explicit statement of the test implications of the major premise in light of an operational definition of the object in the minor, together with an actual test of these implications. Since the minor spells out the conditions for discriminating between the presence and the absence of the object, the conclusion likewise comprises a statement of both the positive and the negative implications of the major, but the test is necessary to determine whether or not both of these sets of implications are borne out by the facts.

The logical complexity and the concrete imponderability of testing are, of course, as great in deduction as in induction. But while the function of induction to generate likely hypotheses tilts testing in induction toward verification, the bias of testing in deduction is toward falsification because of the function of deduction to vet the realism of hypotheses. Tests are devised to exclude the possibility of a hypothesis being refuted by the evidence or of the evidence justifying an alternate hypothesis. Due allowance must be made, of course, for the benefit to be gained from the verification of valuable theories: demonstration is sweet indeed, and the proof of exclusive causality a researcher's dream. But since induction can always provide new information and suggest innovative hypotheses, there is nothing to be lost in deduction by restricting inclusion into the body of theory to hypotheses capable of surviving the most exacting of trials.

At this point deduction doubles back upon itself, the synthetic movement of eduction yielding to the analytic movement of (what we can call) reduction. Whatever the outcome the tests of the implications may have, it is necessary to compare the results to the original hypothesis. Even in the absence of refutation, experimentation normally requires a revision, perhaps a series of revisions, of a hypothesis, as the concrete effects of an object reveal the ramifications of its nature. But experimentation can also compel a radical reinterpretation of the terms of a hypothesis; at the extreme it can entail a transformation of the definition of an object into another framework altogether. Reduction couples with eduction to establish a reflective equilibrium between the virtually logical necessity of the counterfactual condition in the major and the concrete details of the physical evidence.

In reduction, insight is no less important than in education. Its function now, though, is to discover the basis for an essential rather than an operational definition of an object. Only an essential definition can mediate between the results of testing and the structure of theory. In every field the goal of reduction is a theory that is complete and consistent. Until one is found, the field is in crisis; once one is found, the "normal science" of puzzle-solving can begin or resume. The ultimate goal of reduction itself is the assimilation of one theory to another in a series of higher viewpoints culminating ultimately in a unified hierarchy of theories coterminous with the world itself.

Thus deduction results in a genuine increase in knowledge. Formally, it can add a complete and consistent articulation of the consequences implicit -- but not clear from induction -- in the statement of an explanatory hypothesis. Materially, it adds a determination of the soundness of an explanation, an understanding of the nature of the objects to which the explanation applies, and the possibility of using the explanation to make accurate predictions about the future. Deduction, therefore, is not simply academic.

Yet for deduction to be formally apodictic, a theory would have to be framed in a formal language and based upon indubitable and indisputable observation. What is more, the observations themselves would have to have been made according to categorical and impartial criteria, while the language of the theory would have to be reducible, not just ideally but actually, to a formal system. These conditions do not, of course, obtain.

Still, in the absence of ideal justification, the validity of deduction is salvaged by the dialectic between deduction and induction in the self-corrective process of learning. By testing the realism of a supposition about the causality of an object, deduction narrows the focus and expands the range for induction to search for testable signs of the object. In return, induction can provide deduction with more precise and better substantiated hypotheses to test. This cyclical recursion between the two processes enables inquiry to become progressively more ingenious on the one hand and more critical on the other. The rationality of learning can be gauged, therefore, as much by the number and the magnitude of the problems it raises as by the aptness and certitude of the solutions it provides.

Summary

A constructive analysis of induction and deduction within the context of inquiry suggests that while they share the same structure they have complementary functions. The structure they share is the form of inference, which is on this analysis a conditional argument with a biconditional major, a disjunction in the minor reflected in the conclusion, and a conclusion with both logical and factual components. The inference oscillates between analysis and synthesis -- from research into empirical data, to the formulation of a hypothesis, and back again -- until it reaches a reflective equilibrium between theory and fact. This process is not a simple recursion, though; it is a cycle, with two phases. One, induction, has the function of generating and explicating the meaning of hypotheses, while the other, deduction, has the function of testing the realism of hypotheses and reducing them to the framework of systematic theory. In each complete cycle, induction supplies deduction with more precise and more ample hypotheses, as deduction reciprocates by narrowing the focus of induction to more relevant details and broadening its scope to include new evidence. Thus the dialectic between induction and deduction enables inquiry to become a self-corrective process of learning.

Notes

1. See the extended discussion of the issue in *Informal Logic Newsletter* 2 and 3 (1979-1981) and *Informal Logic* 2 (1984).

2. John Stuart Mill, *A System of Logic Ratiocinative and Inductive, Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation*, vol. 7 of the *The Collected Works*, ed. J. M. Robson and intro. R. F. MacRae (Toronto: University of Toronto Press; London: Routledge & Kegan Paul, 1973): 183-208.

3. Edward Mackinnon, "Cognitional Analysis and the Philosophy of Science," *Continuum* 2 (1964): 353-54. See Nelson Goodman, *Fact, Fiction, and Forecast*, 4th ed. (Cambridge: Harvard University Press, 1983), 59-83, for analyses of the consequent paradoxes.

4. This is the common presuppostition of the positivist philosophy of science. One recourse is to try to justify induction in terms of either a rationalistic or an empiricist interpretation of Bayes's theorem: see Rudolf Carnap, *The Logical Foundation of Probability*, (Chicago: University of Chicago Press, 1980), sec. 55, *vs.* Wesley Salmon, "Carl Hempel on the Rationality of Science," *Journal of Philosophy* 80 (1983): 555-62. The other recourse is to rely solely upon deduction for either the verification or else just the falsification of hypotheses: see Carl Hempel, *Philosophy of Natural Science* (Englewood Cliffs, NJ: Prentice-Hall, 1966): 6-8, *vs.* Karl Popper, *The Logic of Scientific Discovery* (German original, 1934; original translation, 1959; reprinted in New York: Harper Torchbooks, 1968), 27 -49, 93-111, 251-81, 311-17. For a recent criticism of the latter alternative, see Adolf Grünbaum and Wesley Slamon, eds., *The Limitations of Deductivism* (Berkeley and Los Angles: University of California Press, 1988).

5. One consequence is, as Jaakko Hintikka notes, in "Advice to Prospective Philosophers," *Proceedings and Addresses of the American Philosophical Association* 62/1 Supplement (1988): 272, "The teaching of reasoning and critical thinking also suffers because there exists no real theory for reasoning and argumentation and hence no theory to serve as a backbone for educational practice (instruction, textbooks, etc.) in this area."

6. William E. Murnion, "The Self-Corrective Process of Learning," *Argumentation: Perspectives and Approaches*, Proceedings of the Conference on Argumentation 1986, ed. Frans H. van Eemeren et al. (Dordrecht/Providence: Foris Publications, 1986), 3A:381-88.

7. This is a matter I have analyzed at length in "The Logic of Learning," *Philosophy Research Archives* 12 (1987): 267-91.

8. Bernard Lonergan, "The Form of Inference," in *Collection: Papers by Bernard Lonergan*, ed. F. E. Crowe (New York: Herder and Herder, 1967): 1-15.

9. This notion is not entirely conventional, but I think it is clear enough.

10. William E. Murnion, "Formality and Informality in Reasoning," *Proceedings of Conference 87 on Critical Thinking* (Newport News, VA: Christopher Newport College, 1988), forthcoming.

11. Richard Rorty, "Intuition," *The Encyclopedia of Philosophy*, ed. Paul Edwards (New York: Macmillian; London: Collier, 1967), 2:204-12.

12. Murnion, "Formality and Informality."

13. Francis Bacon (Baron of Verulam, Viscount St. Albans), *The New Organon and Related Wrintings*, ed. Fulton H. Anderson (Indianapolis and New York; Bobbs-Merrill, 1960): 151. See also David Hume, *A Treatise of Human Nature*, 2 vols., ed. and intro. A. D. Lindsay, (New York: Dutton, 1913), 1:31-33, and Mill, 7:284, 288, 306.

14. Charles Sanders Peirce, *Collected Papers*, 5 vols., ed. Charles Hartshorne, Paul Weiss, and Arthur Burks (Cambridge: Harvard University Press, 1965), 1:§§65-74, 608; 2:§§95-104, 266-70, 508-16, 619-46, 706-91; 5§§144-46, 171-73, 180-205, 276, 579-91; 6§§ 144-46,468-73, 522-29. Peirce's analysis was adopted by, among others, Norwood Russell Hanson, *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science* (Cambridge: Cambridge University Press): 86-90, and Herbert A. Simon, "On Judging the Plausibility of Theories," *Models of Discovery and Other Topics in the Methods of Science* (Dordrecht-Holland and Boston: D. Reidel, 1977): 43. From a different perspective, Joseph Thomas Clark, in "The Form of Inference" -- Revisited," *Continuum* 2 91964): 405, denominated the same procedure "reduction."

15. David Hume, *Treatise*, Book 1, Part 3; idem, "Enquiry Concerning Human Understanding," in *Enquiries Concerning Human Understanding and Concerning the Principles of Morals*, ed. and intro. L. A. Selby-Biggs, 3d ed., rev. with notes P. H. Nidditch (Oxford: Clarendon Press at Oxford University Press, 1975), Sections 4-7; idem, "An Abstract of a Treatise of Human Nature," in *An Inquiry Concerning Human Understanding*, ed. and intro. Charles W. Hendel (Indianapolis and New York: Bobbs-Merrill, 1955): 185-93.

16. For an analysis of insight as the keystone of knowledge see Bernard J. F. Lonergan, *Insight: A Study of Human Understanding* (London, New York, and Toronto: Longmans, Green, 1957).

17. The term, "reflective equilibrium," comes from John Rawls, *A Theory of Justice* (Cambridge: Belknap Press of Harvard University Press, 1971): 20, but Rawls got the idea from Goodman, 65-68.

18. Bacon, Book 2, chs. 10-20 (pp. 130-62); Sir Isaac Newton, *Mathematical Principles of Natural Philosophy and His System of the World*, trans. Andrew Motte and rev. Florian Cajori (Berkeley: University of California Press, 1960; reprint of 1934): 398-400; Hume, *Treatise*, section 15 (1:170-73), and *Enquiries*, section 5, part 2 (pp. 41-43); Mill, 7:388-400; Lonergan, *Insight*, 70-102.

19. Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2d enlarged ed. (Chicago: University of Chicago Press, 1970).

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On The Analogy Between Kuhn's 'Normal Science' and Critical Thinking: A Quest for a Useful Canon of Texts

Gordon E. Whitney

T. S. Kuhn (*The Structure of Scientific Revolutions*, 1970) provides a model for the analysis of the history of an academic discipline. His analysis is limited to selected fields in the physical sciences in which he was able to utilize his "present competence" (p. ix). He achieves order out of a maze of historical facts by organizing his interpretation around the key terms: Paradigm, Normal Science, Anomaly and Scientific Revolution. Kuhn acknowledges that it was from J. B. Conant (1950) that he obtained his concept of identifying significant progress, as a series of "scientific revolutions." Toulmin (1958: 101-127) claims to show that Kuhn's use of the term "revolution" is inaccurate. The outcome of this debate is not significant for the goals of this paper, nor is any claim made here to present a complete analysis of Kuhn's work. Instead, the agenda of this paper is limited to: (1) the establishment in principle of a corpus which both spans the disciplines and is suited for the demonstration of critical thinking tools; and (2) addressing the seemingly intractable problem of how general methods can aid in the content-based analysis required in a specific discipline.

As proposed below, the core of the corpus should include examples from mathematics, physical science, law and history. The purpose of this breadth is to offer by concrete examples, a collection of texts suited to challenge the usefulness of any proposed critical thinking method.[1]

In place of the term "revolution" (used by Conant and then by Kuhn) here the less controversial term "milestone" will be used. By this metaphor we allow some milestones to be judged "taller" and to be more visible, indicating a point of more significant transition. Further we could add color to the stones to suggest that at certain times, some scholars were blind to the presence of stones of a certain color. They were only able to see those milestones they were accustomed to see and were unable to recognize the presence before them of new milestones.[2]

Kuhn's concept of a controlling-paradigm is that it consists of: "Universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners" (p. viii). In addition the paradigms are: (1) able to attract a community of practitioners in the presence of competition for their attention; and (2) able to offer sufficient generality as to provide an open agenda for additional problem solving (Kuhn, p. 10). An example of such a paradigm is the place Isaac Newton's *Principia* held for a time in celestial mechanics.

Kuhn makes the dependence of normal science on a controlling paradigm even more specific. Since the paradigm offers a promise of success, normal science consists in an actualization of that promise: (1) by extending the knowledge of those facts that the paradigm displays; (2) by increasing the extent of the match in paradigm predictions; (3) by further articulation of the paradigm itself; and (4) through the study of paradigms, students are prepared for membership in a specific scientific community (pp. 23-24).[3]

In summary then, paradigms are: (a) discipline-specific; (b) in existence for observable periods; (c) able to provide an open-ended charter for the conduct of normal science.

However, critical thinking because of its generality, is not restricted to one discipline and needs an agreed upon corpus. Given this, it would be possible to begin a program of analysis based on important classical problems. This approach agrees with Garver (1985) on the need for a corpus but differs as to its content. It holds with Govier (1985) the usefulness of analogy; and it argues against McPeck (1985) by using Kuhn rather than rejecting him (cf. Paul, 1985).

Examples of a corpus which spans the disciplines

1. Euclidean Geometry.

This system was the result of a long tradition of rigor in Greek mathematics (Barker, 1967). It proceeds in a strictly logical manner: first basic definitions (line, point, angle), then axioms (some were called postulates but the distinction is unnecessary) and then theorems based on figures and their properties often established from more primitive theorems by significant constructions. The proofs often depend on and establish equivalence relations of the sums of lengths or of angles under certain theorem specific conditions. Much of mathematics proceeds in a similar manner. We now understand that such a system is not intuitive to the human mind nor is it absolute or necessary. Rather this Euclidean system of principles and proofs establishes truths which are "theory-relative."

For the purpose of being able to draw conclusions by analogy, certain simple theorems should be a part of the basic knowledge of any person equipped to do critical thinking. Two of these are of special interest because they establish equivalence relations involving quantities. The area of a rectangle is the product of the lengths of it two distinct sides. If L is the length of a straight line, then L-squared is the area of the square of which L is the common side.

The Pythagorean theorem relates to a right triangle whose sides a and b are adjacent to the right angle and whose hypotenuse is c. The theorem states that the area of the square of side a plus the area of the square of side b is equal to the area of the square of side c.

If a and b are equal, then the proof can be seen as a simple paper cutting exercise. For $a=b$, the ancient proof is difficult. A modern proof which is elegant and easy (first published in 1873; Gardner, 1966: 58-69, esp. fig. 20) relegates the ancient proof exclusively to antiquarian interest.

The second quantitative theorem states that for any triangle the sum of the angles equals two right angles or 180°. The theorem has several proofs all involving simple constructions. These theorems, particularly the last, have been cited continuously from ancient times as providing models of truths which must be shared by all and which are permanent, not subject to change or revision. For critical thinking they form a basis for comparison with other claims to truth which may or may not be as equally strong and valid.

Historically Euclidean geometry has been admired as a model of an interrelated collection of propositions whose truth is not to be questioned. Thus the Berlin Academy in 1764 posed the following public question: "Are metaphysical truths generally, and the fundamental principles of natural theology and morals in particular, capable of proofs as distinct as those of geometry? If not, what is the true nature of their certainty?" (Walsh, 1967: 307). Kant answered with the essay: "On the Distinctness of the Principles of Natural Theology and Morals" (1764). He drew a series of radical distinctions between argument in philosophy and argument in mathematics. The mathematician starts from definitions that are in effect arbitrary combinations of concepts. The philosopher must work toward definitions, not argue from them, since his business is to "analyze concepts which are given as confused." Mathematics contains few unanalyzable concepts and indemonstrable propositions; philosophy is full of them. Mathematical ideas can always be observed *in concreto*, whereas the philosopher, having nothing to correspond to mathematical diagrams or symbolism, necessarily works on a more abstract level.

The point of citing 18th century Germany in this connection is to show the continuing tradition which elevated Euclidean geometry both as a model for truth and as a standard of comparison for all rational inquiry.

2. The Theory of Numbers.

The integers are defined as including three groups or sets: the positive natural numbers (1,2, ...) and their negatives (-1, -2, ...) and zero (0). The natural numbers suffice for addition and multiplication. Subtraction is not a closed operation without both zero and the negatives of the natural numbers.

In ancient geometry it was possible to construct objects based on the ratio of natural numbers. In a 3,4,5 right triangle, each pair of sides define a distinct ratio: 3/4, 4/5, and 3/5. These ratios were called "rational" numbers. The natural numbers and the rationals were the known universe of numbers. However, the Pythagorean theorem led to the question: "What kind of a number was the side of a square whose area was 2?" We now know this to be a form of the general question of finding roots of algebraic equations. Some roots are neither integers nor rationals and are called "irrationals," numbers whose decimal expansion is both non-ending and non-repeating. In antiquity a geometrical proof of this fact involved constructing an unending series of squares of successively smaller area. This was a recursive procedure and made the computation of the original square root depend on an infinite series of embedded smaller and smaller square roots (Rademacher, 1957: 24).

The ancients came to the conclusion that the computation of an irrational was an unending process. For a square whose area was an even magnitude, e.g. 2, the proof could be obtained by showing that no ratio of integers could exist which when squared would yield exactly 2. This argument was based on the odd/even properties of numbers, squares and reduced ratios (Danzig, 1933). Both Plato ("Laws", 820a-c) and Aristotle ("Posterior Analytics", 76b) cite the knowledge of irrationals as basic for an educated, critical thinker.

Popper (1969: 86-87) suggests that the discovery of irrationals was a factor in the decline of the Pythagorean order as a community. He observes that these magnitudes were not recognized as numbers and yet their existence could be proved. This fact destroyed the hope of deriving cosmology, or even geometry, from the arithmetic of natural numbers.

3. The theory of infinite sets

Georg Cantor (1845-1918) made a pioneering advance in mathematics by his creative approach to infinite sets. A finite set is an unordered collection of unique members, with an upper bound on the size of the largest collection. A bounded subset of the integers form the most common finite set. Such a set is closed under the operations of union, intersection and complement and hence forms a boolean algebra.

However, infinite sets are much more difficult to model, and there seemed to be different kinds of infinity but the differences could not be characterized. Cantor devised a method of proof based on 1:1 correspondence as a basis of comparison of infinite sets and he introduced new terminology. He called any set which can be placed in 1:1 correspondence with the natural numbers "denumerable. "He proved that any pairing (x, y) of elements from a pair of denumerable sets is also denumerable.This was done by placing in increasing order the elements of the first set on the X axis and the elements of the second set on the Y axis. He then ordered the pairs of elements (x, y) by passing through each point in the plane on a series of diagonals proceeding outward from the origin.

The method of proof was novel, and some opposed the results. Using a different method of diagonal argument (traveling at a 45 degree angle) on a single line outward from the origin) he was able to prove that the set of real numbers was not denumerable. The proof was by contradiction: for any denumerable ordering of the real numbers he could produce another real number which was not in the assumed list.

When mathematics sought greater generality in its theorems and systems, a set theoretic approach was taken. Systems were defined in terms of the specified set of objects and the closed operations on those sets. For this development, Cantor's distinction of the different kinds of infinity was essential.

4. Axiomatized Theories.

Euclid based his proofs on a logical foundation consisting of definitions, axioms and postulates. His fifth postulate, implied that the figures, which are the objects of proof, lie in an infinite flat plane. The postulate required that any pair of straight lines cross if they are not parallel, otherwise they never cross. The Jesuit Saccheri (1733) published what he claimed was an indirect proof of the consistency of the Euclidean system. He constructed a new system where the fifth postulate was altered and claimed to show that this new system was inconsistent. If he had been right, there would have been only one kind of geometry, but he was wrong. His proof was shown to be flawed, and the next major step was carried out independently by Lobachevsky and Bolyai (1831).

The importance of this step for critical thinking is that as basic as Euclid's theorems are to the concept of truth, all these theorems are merely theory-relative and are neither absolute nor intuitive as was widely assumed prior to 1830.

The consistency of the Euclidean system has never been proved, nor is it to be thought an especially superior system in terms its claim to represent truth. It has been shown that the consistency of non-Euclidean geometries is equivalent to that of the Euclidean.

The only route that could be found for consistency in geometry was to relate the theorems to the properties of the real numbers. However, consistency of operations on the real numbers was contingent on a proof of consistency for the natural numbers with the operations of addition and multiplication.

However this route to a consistency proof was permanently closed when Goedel (1931) proved that for the natural numbers with addition and multiplication no consistency proof is possible. (See Barker, 1967; van Heijenoort, 1967).

5. The History of Chemistry.

In each of the branches of physical science there were major turning points or milestones that set the direction for the work that followed. In chemistry the related discoveries of hydrogen (water-maker) and oxygen (acid-maker) represent such a milestone.

The atmosphere of the earth at sea level consists of water vapor (humidity) and air. The air consists of approximately 78% nitrogen, 21% oxygen and 1% of a mixture of various gases. When any substance is burned containing hydrogen and sulphur, the oxygen of the air combines with these two burning elements to produce sulphuric acid. Because of this phenomenon, Lavoisier named this component of the air "oxygen" from the Greek "generator of acid."

When a metal is dissolved in an acid, hydrogen from the acid is released into the atmosphere. The oxygen of the acid combines with the metal to form a metal oxide. The hydrogen can be collected and when ignited in the presence of "oxygen" (i.e. as it is found in air) produces water.

At the time of Priestly and Lavoisier, these facts were not known in our terms because the existing theory blocked the correct interpretation of the known phenomena. The ancient Greeks held that all that exists materially was composed of air, water, fire and earth.

By 1770 this primitive theory had evolved partly by conjecture to posit the existence of two mythical substances--caloric (the source of heat) and phlogiston (the source of fire). They were both regarded as colorless, odorless and weightless substances.

A major milestone in chemistry took place when the mutually related properties of hydrogen and oxygen were shown by closed loop experiments to explain the phenomenon and to conform to the new principle of the conservation of matter. This principle held that matter was preserved when transformed into a new state by heating, burning or chemical reaction.

Lavoisier eliminated the myth of phlogiston but not that of caloric. This was accomplished later by a discovery of the true nature of heat (see Conant 1950; Kuhn 1970: 53-56).

6. Constitutional Law.

The decisions of the Supreme Court are in a form suited to analysis by critical thinking methods. However not all of the decisions are of general interest. The one chosen for discussion here has general interest as well as historical significance.

In the Supreme Court case of Dred Scot v. Sanford (1857) the majority opinion written by Chief Justice Taney prevailed by a vote of 6 to 2, Justices McLean and Curtis each wrote a dissenting opinion. Cushman (1984: 123) commented, "[the opinion was] the most notorious one ever handed down . . . and brought [the court's prestige] to an all-time low. "Taney's opinion (it runs about 4000 words) ruled that: Dred Scott, a slave, who had been reckoned as free by reason of his residence in a free state and a federal territory, was to be reckoned a slave again upon entering the slave-holding state of Missouri. The ruling included the decision that because of Constitutionally-guaranteed property rights, the Congress had no power to prohibit slavery in the territories. This invalidated the Congressional Act known as the "Missouri Compromise."

Although Taney had released his own slaves, his argument in its selection and interpretation of evidence were clearly "pro-slavery." Yet in his appeal to the literal meaning of the constitution he established important principle with these statements:

> *If any of the provisions [of the constitution are] deemed unjust, there is a mode prescribed in the instrument itself by which it may be amended, but while it remains unaltered, it must be construed now as it was at the time of its adoption . . . any other rule of construction would abrogate the judicial character of this court, and make it the mere reflex of popular opinion.*

This is a text shared by many disciplines and the exclusive property of none. It will remain a touchstone for any theory of interpretation.

7. The Philosophy of History.

Any corpus which seeks to span the academic disciplines must have a section devoted to history. Not only does the past have a historical record and a network of milestones which mark significant transitions, but "the writing of history" itself has both such a past and a present.

Since history is a vast area and significant milestones are subject to distortion in brief presentation, I suggest that the corpus should focus instead on the philosophy of history which uses classic examples of history writing as its basis.

Here two essays could be set in opposition. One pair I have found are: Carl Hemel's "The Function of General Laws in History," (1942) and in opposition to this, Brooke Williams' "History in Relation to Semiotic" (1986).These essays run to about 4000 words each and are suited for dialogue, analysis and reflection about this subject.

I am not suggesting that these essays are classics and are corpus-worthy, but that this genre of "philosophy-of-history" writing is worthy of a place in the desired corpus. History as a discipline forms a bridge between the hard and soft sciences and yet lies wholly outside the realm of repeatable experiments. Williams has noted that although much effort has been devoted to the methods of history, there has not been discovered any "logic of history" which finds acceptance among historians. This he suggests is through no fault of the historians but rather because of the nature of the subject matter which (he holds) is better fitted into a framework more flexible and powerful than logic. For him this is found in Semiotics. One need not fully agree with Williams to observe that he claims to have identified a significant anomaly ("history has no logic") suited to further study.

General Methods Versus Discipline-Specific Knowledge

Kuhn has applied the general principle of controlling-paradigm to a variety of fields in physical science. His success would persuade us that the "paradigm principle" is itself more general than any specific paradigm and indeed may be a demonstration that there are general methods which span the disciplines. Also he has observed that anomaly is a discovery achieved only within a paradigm but is a discovery which leads outside the boundaries of the paradigm. This concept seems to be a general principle. This leaves his term "normal science" to be extended in order to achieve an increase in generality.

This could be done by replacing "science" with a more general term such as: criticism, analysis, interpretation, commentary or explanation. While acknowledging the arbitrariness of such a choice, the term "normal analysis" seems to offer the most neutral significance. We propose then that critical thinking attempt to make progress by modeling its efforts after what Kuhn has done. First, to establish a working corpus, second, to identify the discipline specific controlling-paradigms, third, to abstract the content of normal-analysis and fourth, to collect recognized anomalies. This could be facilitated by discipline specialists who would contribute to the milestone-based history of their own discipline while paying attention to the principle of paradigm as it is evolved in fields both near and far from their own. Probably the mathematicians would be least interested, followed by the historians.In these cases we would turn to those who contribute to the philosophy of these disciplines for the required contributions.

The overall program could be coordinated and discipline exchange facilitated by a Center for Critical Thinking. The long term goal would be a re-integration of the academic disciplines from within in a way which avoids the superficiality of surveys by including in its corpus classic hard problems.

McPeck (1985) has suggested that the focus on fallacies in critical thinking is a sign of its weakness. However an approach based on "the general principle of paradigms" does not depend on an encyclopedia of fallacies nor does it exclude this technique where it can be useful. The approach proposed here emphasizes spanning the disciplines as an essential criteria for success in critical thinking. Given an acceptance of some proposed corpus, the next step would be to actually find the relevant paradigms and carry out the steps of "normal analysis" noting along the way significant milestones and anomalies.

The following key questions were included in the dscussion:

QUEST: What has T. Kuhn to do with this proposed corpus?

ANS: Every example in the corpus is suited to interpretation within the framework of the general principle of paradigm. Also each example is also a result of paradigm conflict and resolution. This is implied in the paper but left to the reader to draw as his own conclusion.

QUEST: What about the possibility of "failed paradigms?"

ANS: This is included in the ideas of paradigm clash and paradigm replacement. In history a classic example is slavery which in America became a "failed paradigm."

Endnotes

1. Others devising a corpus may feel inclined toward speeches, editorial, fiction or poetry. Among these the most promising would seem to be speeches having historical significance. President Lincoln's Gettysburg Address and his Second Inaugural would qualify as corpus-worthy if speeches were included as a special discipline. Garver (1985) notes: "there is something wrong with a method that works for newspaper editorials but cannot handle Lincoln's Second Inaugural Address."

2. This color-blindness is explained by Kuhn as the normal function of a controlling-paradigm. Those who have been trained to work within the paradigm have minds fixed on its truths and on bringing its prophecies to fulfillment (viii).

3. Kuhn (p.175) tries to distinguish rule and paradigm. The problem is that rule, like game or tool, is such a common term that an attempt to

assign it a precise meaning is bound to fail. Commentators would need to employ a term like "Kuhn-rule," "general-rule," or "paradigm-rule" to provide unambiguous meaning. I would characterize Kuhn's attempt to bring "rule" into his technical vocabulary as having potential usefulness but that its exposition is currently incomplete, and that therefore his suggestions on this topic should be used with caution.

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Critical Thinking Theory: Contemporary Issues

Critical thinking is especially concerned with issues of contemporary life. Critical thinking should, among other things, equip students to engage meaningfully with the environment in which they live. In the following papers, authors address such contemporary issues as nuclear arms (Rykiel) advertising (Beyers, Hovanec) and television (Langsdorf).

The first paper, *"Nukespeak": The Use of Language to Deny the Deadly Consequences* by Joan D. Rykiel addresses a crucial example of how categories of thought are structured through language. Rykiel contends that "In the subculture world of defense intellectuals there is an elaborate use of sanitized abstraction, sexual imagery, evoked images of domesticity and religion, and euphemisms which allow infinite discussions about nuclear war without ever forcing the speaker or enabling the listener to touch the reality behind the words." Although language is not responsible for the entire problem of nuclear weapons, it "reveals a whole series of culturally-grounded and culturally-acceptable mechanisms which make it possible to work in defense institutions which foster the proliferation of nuclear weapons and to plan mass incinerations of millions of human beings." Through her analysis Rykiel attempts to show how the language of "Nukespeak" is more than simply a vocabulary or a device for stating information, but rather places both speaker and hearer (or writer and reader) into a particular "mode of thinking about nuclear weapons, military and political power, and the relationship between human ends and technological means."

The second paper, by Gene Beyers, *The Language of Advertising and Critical Thinking* explores how individuals reach conclusions about the meaning of advertisementss by offering an analysis of context and levels of understanding. Advertising, Beyers notes, offers a context for critical thinking and in particular offers materials that are rich in stucture and in relationships to factors that relate essentially to human thought. Beyers attempts to show that such critical thinking skills as identifying underlying assumptions depend on the analysis of context and that "when an ad is placed in a different context, both the underlying assumption(s) upon which the context is based and the meaning of the ad, itself, change." Beyer's paper analyzes a number of ads looking for their relationships to such contexts as "the larger culture," to the "a psychology of having" and to "persuasion and manipulation of meaning."

Carol Hovanec addresses a different set of concerns in her paper, *Using Advertising to Teach Critical Thinking and Writing.* She takes advertising to be a "most common element in our society" and " one of the most effective means to help students recognize persuasive devices and gain a sense of audience." Her analysis includes psychological perspectives on language and the "rich symbolism" that has been developed over the centuries. Her goal is to help "students to recognize that they are being swayed by devices which they may have taken for granted."

The final paper in this section, *Reasoning in the Language of Television*, by Lenore Langsdorf explores the relationship of the practice and teaching of critical thinking to the "literate culture which is familiar and comfortable to teachers" in contrast to "the visual/aural language of television" that is basic to students. Langsdorf is concerned with "highlighting some similarities and differences between the languages of printed and video texts, in relation to some traditional logical structures we use in everyday reasoning." She maintains that critical literacy in regard to both print and television is best developed from a basis which recognizes and respects their similarities and differences." Her arguments rests on an analogy with "bicultural/bilingual education which strives to add to the student's primary culture, rather than replace it." Understanding the languages of both print and televisual media enables students to "to see their native culture more clearly by experiencing another cultural environment." This should help both students and teachers to come to understand "the grammar and syntax of their primary language for the first time by virtue of its contrast with the language they are learning."

"Nukespeak": The Use of Language to Deny the Deadly Consequences

Joan D. Rykiel

There is a cartoon portraying two prehistoric men wondering, now that they had learned to talk, about what they would talk; the humor of it lies mostly in the fact that language would probably never have developed unless it had served some function. "Speech," wrote Benjamin Lee Whorf, "is the best show man puts on." [1]

Purpose of Paper

It is the task of this paper to elucidate in part the meaning of this statement by attempting to explain how man is able to put on such a marvelous display. Perception in a very broad sense - a person's beliefs about the entire world around him, including especially the people in it - is pertinent here. Policy makers (like all human beings) are limited-capacity information processors who resort to simplifying strategies to deal with the complexity, uncertainty, and painful trade-offs which confront them in the nuclear age. Language influences but does not unilaterally determine thought processes: instead there is an interdependence of language and thought. In this article I look at the usefulness of the Sapir-Whorf hypothesis for the nuclear age, then present and define "nukespeak." I explore how speech is being twisted so that policy makers can construct and maintain their simplified images of the environment. Some potential outcomes are examined. Throughout this article I maintain that "nukespeak" inhibits or misguides people's thinking, and therefore, works against our best interests. Some suggestions and strategies of how to overcome this problem will finalize this paper.

Theoretical model

The idea that the structure of one's language affects one's thought processes may be called the linguistic-relativity hypothesis because it asserts that thought is relative to the language in which it is conducted. It asserts that a particular language implies a unique "world-view" or perception of reality, and this point of view has been discussed by linguists and philosophers since it was first suggested by Herder more than 200 years ago. The most articulate advocate for the theory of linguistic relativity was the linguist Benjamin Lee Whorf, and in one of the best assertions of his point of view he wrote:

> The background linguistic system of each language is not merely a reproducing instrument for voicing ideas but rather is

> itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade. [2]

Symbols and symbolic combinations may have a logic of their own and be in contradiction with the logic of concrete reality. Whorf's thinking has had an important influence on general semantics, which is particularly concerned with verbal usage that falsifies or seriously distorts concrete reality. A large part of our knowledge about reality is given to us by proxy, through language, through other people. [3]

Many studies that were prompted by the Whorf hypothesis have shown that it can be accepted only with certain important reservations. All of the available studies do not, however, lead to the conclusion that the perception of the world is wholly determined by linguistic forms. Criticism of the Whorf hypothesis by authors such as Lenneberg (1953) and Lenneberg and Roberts (1956) has shown that the alliance between language and perception is more involved and circuitous than was at first supposed. [4 and 5] A detailed analysis of this criticism, however, is beyond the scope of this paper.

It is doubtful whether the connection is as direct as Whorf saw it. The Whorf hypothesis makes the most sense when we lack ready-made forms with which to delineate an event and so are compelled to a unique formulation. If such a formulation is beyond our abilities, we may be unable to assimilate an experience and, as a result, either lose it or be forced to maintain an uncomfortable, undigested mass of knowledge. Sometimes ready-made formulations offer a near fit and we accept these rather than make the exertion required for a more rigorous statement, with a consequent blurring, misrepresentation, or falsification of experience. [6] The entry into the nuclear age fits this scenario, and, therefore, this hypothesis becomes a useful theoretical framework.

If the individual thinks in cliches, or allows the connotations or words to dominate his or her denotative meaning, or is content with words that obscure the facts, then thinking is linguistically determined. If, on the other hand, one systematically checks formulations against empirical fact, then it is not. [7]

Nukespeak

Chilton (1986) coins the term "nukespeak" and, in doing so, he makes three salient points. There exists a specialized vocabulary for talking about nuclear weapons and war together with customary metaphors, and even preferred grammatical constructions. This variety of English is not neutral and purely descriptive, but ideologically loaded in favor of the nuclear culture. This matters because it is possible to affect how people think about the subject and restricts the ideas they exchange about it. [8]

Noam Chomsky has pointed out that in Western democracies

> ...state censorship is not necessary, or even very effective, in comparison to the ideological controls exercised by systems that are more complex and more decentralized. ... What this system attempts to do is to fix the limits of possible thought... [9]

Many words and phrases are used as a social control in this nuclear age to deceive people, to purposely distort facts, to conceal intentions and purposes. Others are used to intoxicate, to hypnotize, to mystify people in order to manipulate them. [10]

"Nukespeak" strategies

The problem for the new "nuclear culture," linguistically speaking, was what words to use to refer to the new thing, how to seize a new concept, and also how to hide from the many the terror that had been viewed by the few. [11]

"Nukespeak" uses certain important words that have ambiguous meanings

Meerloo (1952) points out that most professional jargons are meant to have an enchanted impression on civilians. Through the use of words, some things are purposefully made more mysterious. Discussions of nuclear war abound with ambiguous terms.[12] As an example, the word "military strength" has two rather different meanings that are not always clearly distinguished. Military strength can mean the capability to harm other nations and to threaten them; it can also mean the capability to resist harm intended by others and to be immune against threats. Fischer (1984) mentions that this ambiguity has hampered clear thinking about these issues.[13] Some mistakenly believe that it is necessary to threaten others to be invulnerable themselves.

The term "nuclear war" itself is not well defined. In conventional wars there have often been winners who gained some advantage that outweighed their own losses. In a war between two countries possessing nuclear weapons, it is meaningless to speak of a winner: "Nuclear genocide" or "nuclear omnicide" would be more exact terms. Why won't any persons in charge use these words? Instead, the policy makers continue to talk about "limited nuclear war." With the advent of thermonuclear weaponry, nuclear war means just the destruction of people and the environment: there can be no winners. An important point is that this circumstance has not penetrated the consciousness of many people, and "nukespeak" perpetuates this problem.

"Nukespeak" misinforms

Language can be utilized to repress facts, suppress truth, and to present purposefully misleading information as a means to misinform people and to confuse their loyalties and convictions.[14] Virtually no one with either responsibility or knowledge - with perhaps the exception of President

Reagan and Edward Teller - believes that SDI (Strategic Defense Initiative) is an effective defense. The result has been confusion about the objective of SDI, and this has been compounded in the last few years by references to SDI 2 and the introduction of the phrase "interim deployment plans."[15] How many people are aware that this plan actually means that the intention of the government is to provide a partial or exclusive defense of only military assets and not civilian centers? Such clarification would, however, not likely serve the Administration's interest and SDI would lose much of its popular support.

"Nukespeak" uses catchwords, acronyms, and familiar imagery

Catchwords, slogans, acronyms, and the use of familiar imagery are so widely resorted to because they are such effective means of getting people to "walk in step." Lumley has called attention to the characteristics of a good catchline: it is simple to understand, easy to remember,pleasant to repeat, has a rhythmic quality, brief and easily repeated, affirmative, and finally, it appears to summarize a profound idea.[16]

Carol Cohn, in an interesting article, reports that a small supersonic rocket "designed to penetrate any Soviet air defense" is called a "SRAM" (short-range attack missile). Submarine-launched cruise missiles (SLCM) are referred to as "slick'ems" and ground-launched cruise missiles (GLCM) are "glick'ems." The plane in which the President will supposedly be flying around above a nuclear holocaust, receiving intelligence and issuing commands for where to bomb next, is called a "kneecap" (for NEACP - National Emergency Airborne Command Post). In other words, it is enjoyable to talk about nuclear weapons. "The words are quick, clean, light"; they roll right off your tongue. [17]

The fact that nuclear weapons are classified as "a deterrent," is a significant ploy. It predisposes the reader to think of them in a certain fashion. "Deterrence" seems to have become for many a synonym - and a dangerous one - for "nuclear missile." This is an important claim - namely that the weapons actually "deter." That is to say, they stop the enemy (clearly, the Russians) from attacking us. This is implied in the semantic structure of the term. Indeed, this powerful single word summarizes the cold war ideology. [18]

Sex. We must look at the wider culture as the history of the atomic age itself is run through with overt images of competitive male sexuality. For example, William Laurence, a journalist who was brought by the Army Air Corps to witness the Nagasaki bombing wrote

> ...there came shooting out of the top a giant mushroom that increased the size of the pillar to a total of 45,000 feet. The mushroom top was even more alive than the pillar, seething and boiling in a white fury of creamy foam, sizzling upward and then descending earthward, a thousand geysers rolled into one... [19]

A former Pentagon target analyst, in telling Cohn why he thought plans for "limited nuclear war" were nonsensical, said, "Look, you gotta understand that it's a pissing contest- you gotta expect them to use everything they've got." Most apparent, this image says that this is about competition for manhood, and thus there is tremendous danger. But at the same time it says that the whole thing is not very serious -it is "just what little boys or drunk men do." [20]

American military dependence on nuclear weapons is explained as "irresistible, because you get more bang for the buck," or "to disarm is to get rid of all your stuff." An explanation of why the MX missile is to be placed in the silos of the newest Minuteman missiles, instead of replacing the older, less accurate missiles, was "because they're in the nicest hole - you're not going to take the nicest missile you have and put it in a crummy hole." Cohn discusses other lectures that were filled with discussions of "soft lay downs" and "deep penetration," - or what one military adviser to the National Security Council called "releasing 70-80 percent of our megatonnage in one orgasmic whump." [21]

The pertinent issue for this topic is not so much the imagery's possible psychodynamic origins as how it functions- its role in making the work world of defense intellectuals feel tenable. It can be a way of minimizing the seriousness of militarist endeavors, of denying their deadly consequences. [22]

Domestic. Nuclear missiles are based in "silos." Crew members on a Trident submarine call the part of the sub where the missiles are lined up in their silos ready for launching "the Christmas tree farm,"[23] where they have a "nuclear exchange." In my mind, this conjures images of gift giving at Christmas time.

Weapon systems can "marry up." These nuclear explosives are not dropped; a "bus" "delivers" them. These devices are called "reentry vehicles," or "RVs" for short, a term that can remind you of the recreational vehicles for a family vacation. "PAL" (permissive action links) is the friendly acronym for the electronic system designed to allow the authorized firing of nuclear warheads. [24] "Little boy" and "Fat man," a respect to our homage of childhood and manhood as seen through the eyes of the military network, applied a nuclear interment to the cities of Hiroshima and Nagasaki.[25] The President's outline for both short- and long-range plans for production of new nuclear weapons is called "the shopping list." [26]

The neutron bomb kills people but leaves buildings largely unharmed. Some refer to this bomb as a "cookie cutter." Now to associate it with the kitchen and cooking is important, since in our myths it is the cooked as opposed to the raw that makes us civilized.[27] Some others call this bomb an "enhanced radiation weapon": note the positive connotation.

Even before the weapons acquire names, they are humanized. They have fathers, though no mothers yet; they grow from infants ("baby nukes") to old age (NATO's allegedly "aging" forces) in a family ("the ICBM family"); they retire ("retiring Polaris forces") and make way for the young ("new generation MX ICBMs").[28]

All this has a reflexive effect, like Pavlov's dogs secreting gastric juices at the sound of the bell. It discharges certain special feelings and sets of a given reaction associated with it. "Nukespeak" can allay doubt, suspicion and criticism, and smothers independent thought. Some seem to have an almost hypnotic effect.

Power of giving life. At Los Alamos, the atomic bomb was declared "Oppenheimer's baby"; at Livermore, the hydrogen bomb was "Teller's baby." Laurence wrote of the first atomic bomb: "One felt as though he had been privileged to witness the Birth of the World." General Bruce Holloway, the Commander-in-Chief of the Strategic Air Command from 1968 to 1972, described nuclear war in a 1985 interview as involving "a big bang, like the start of the universe."[29]

Religious. Does anyone find it a problem that the first atomic bomb test was called "Trinity"? Or that a nuclear submarine that can destroy 160 cities with millions of people in them is named "Corpus Christi" - a town in Texas which, in turn, was named after Jesus Christ? Or that the creators of strategic doctrine actually refer to their community as "the nuclear priesthood"?

Religious associations are never far beneath the surface. Here is a sample: basic power of the universe, the new power, the irresistible power, vast and mysterious power, mighty power, and power manifested in the sunshine. All these phrases were elicited by the news of the destruction of Hiroshima and Nagasaki. This way of talking, linked with the failure to report the complete appalling details, make it possible to imagine that the atomic bomb and its use had been a positive thing. [30]

"Nukespeak" avoids certain words

The word "peace" is left out of "nukespeak" vocabulary. The closest you can come is "strategic stability," a term that refers to a balance of numbers and types of weapons systems - not the political, social, economic, and psychological conditions that "peace" implies.[31] To go a step further, just to speak the word "peace" within the context of "nukespeak" is to label you an emotional, naive, unrealistic liberal.

"Nukespeak" uses euphemisms

There is the almost universal practice of using some kind of figurative paraphrase, a disguising metaphor, a toned-down or "dry-cleaned" name that keeps nuclear reality neutral or remote. By manipulating the words, people think that they can, in some measure, manipulate the disagreeable or sinister reality to which they refer. These terms "soften," "sweeten," or make "more respectable" the expressions for this reality: the indecency of the thing or situation is somewhat lessened. At any rate, the "nice" word sounds better.[32] Such less offensive words are known as euphemisms.

"Clean bombs" are largely fusion rather than fission and therefore releases a higher quantity of energy not as fallout but as blast, heat, and prompt radiation. What a good metaphor for the defense analysts to use to discuss plans for death, mangled bodies, human pain. Cohn guesses that the only dirty part of killing millions of people is radiation. We have "counter value attacks" rather than incinerating cities, while mass murder is translated as "collateral damage." The MX missile was renamed "the Peacekeeper" and they refer to it as a "damage limitation weapon," or, how about the word "footprint," which in actuality means the pattern in which warheads fall on a city.[33] The term "theaters of operations" refers to the actual geographic region that the military will conduct a "war." Computer models and practice sessions are called "war games." These terms illustrate the astonishing distance between image and reality and how this distance can distort our perceptions and redefine the world.

"Nukespeak" nicknames

As Walter Lippmann put it in his aphorism: "First we look, then we name, and only then do we see." Of particular importance is the fact that names assigned to stimuli can modify an individual's responses to those stimuli. This fact is the basis of certain semantic fallacies to which we are prone. S. I. Hayakawa pointed out many years ago that if a certain kind of payment to the unemployed was called "social insurance benefits," it was likely to be perceived favorably, whereas if it was labelled "relief," it was likely to be perceived unfavorably. Experimental analyses of this phenomenon support the conclusion that the label tends to channel the stimulus function of the figure in the direction of the concept represented by the label. Unless the subject has prolonged opportunity to study the figure, it is principally this concept that is remembered, rather than some direct representation.[34]

The naming of weapons systems is not a trivial matter. Chilton suggests that the publicly known nicknames given to weapons systems are a symptom of their advancing assimilation into our culture, also that such names serve to advertise this fact to the civilian population. The pattern of development of the names is itself revealing. The nicknames come from four categories: human types and roles, artifacts of human culture, animals, and gods and heroes. As portrayed on Graph 1, the most frequent nicknames for United States nuclear weapons are gods and heroes. The nicknames given to Soviet weapons, on the other hand, more frequently belittle or minimize: Scarp, Savage, Blinder, Bear, or SS-11. [35]

I will mention just a few examples of names given to the United States weapons: see the appendixes for more information, but, in no way is this meant to be a complete listing. Not quite all, but most of the NATO weapons are given two names: For example, LGM-30F/G is also called the "Minuteman." The "Minuteman" weapon has been bestowed a patriotic role as it refers to the heroic militiamen of the American Revolutionary War who were trained to turn out at a minute's warning. Thus this devastating weapon is given a place in national folklore. Oppenheimer referred to the first atomic device as "the gadget," a synonym that may bring to the surface feelings of comfort, helpfulness, and naturalness. (Later, "the gadget" acquired a name.) During the 1960's "Honest John" had its appearance in Europe, equipping BAOR (British Air Force operations) and the French forces! Comparison with accepted primitive weapons as part of human culture is utilized, as represented by the cruise missile "Tomahawk" -though this one can travel 1,500 miles with a 200-kiloton warhead.[36]

Some potential outcomes

This impoverished communication can lead to distorted views that may intensify and perpetuate international conflict. It is difficult to induce a therapeutic change in a pathological process until the pathology is recognized as such and seen to be unacceptably harmful. [37]

Supports denial

Most of the work on nuclear weapons policy and on the weapons themselves takes place within large bureaucratic settings that affect the intellectual and emotional functioning of those who work within them. Looking back at his participation in target selection for nuclear war, Henry T. Nash states

> I and my colleagues, with whom I shared a large office, drank coffee, ate lunch, and never experienced guilt or self-criticism. Our office behavior was no different from that of men and women who might work for a bank or insurance company. What enabled us to calmly plan to incinerate vast numbers of unknown human beings without any sense of moral revulsion?[38]

"Obscuring the `big picture,'" Nash notes, "helped promote peace of mind." [39]

People are faced with a technology which can affect them profoundly but which they cannot fully understand. In some cases, these reactions lead to nearly total denial, what Robert Lifton (1982) termed "psychic shutdown" or "numbing," the phenomenon that leads the individual to refuse to consider the realities of the nuclear age, even though they affect his life intensely in immediate and long-term ways.[40] As a consequence, John Kenneth Galbraith observes "...we leave the issue of nuclear arms, their control and their consequences, to the men who make horror their everyday occupation. It is reckless, even fatal, delegation of power."[41]

Supports "nuclearism"

As a psychiatrist, Lifton (1979) has examined the writings and statements of numerous individuals who have played important roles in the development of nuclear weapons and policies. He noticed that some tended to become psychologically identified with the weapons and to regard both the weapons and themselves as "saviors" of our freedom and security: a condition he called "nuclearism."

> Nuclearism is a secular religion, a total ideology in which "grace" and even "salvation" - the mastery of death and evil - are achieved through the power of a new technological deity. 42

Supports a victor perspective

Consider the difference in vividness of the words used and the content: the first two segments describe the effects of the Hiroshima nuclear blast on human beings while the last two describe the policies of users of "nukespeak." Consider the difference in perspective.

> A mother, driven half-mad while looking for her child, was calling his name. At last she found him. His head looked like a boiled octopus. His eyes were half-closed, and his mouth was white, pursed, and swollen. 43

> A woman who looked like an expectant mother was dead. At her side, a girl of about three years of age brought some water in an empty can she had found. She was trying to let her mother drink from it. 44

> If we have to start over again with another Adam and Eve, I want them to be Americans; and I want them on this continent and not in Europe. 45

> ...an intelligent U.S. offensive strategy, wedded to home and defenses, should reduce U.S. casualties to approximately 20 million... and that a combination of counterforce offensive targeting, civil defense, and ballistic missile and air defense should hold U.S. casualties down to a level compatible with national survival and recovery. 46

The third segment was a quote from Senator Richard Russell of Georgia who was head of the Armed Services Committee of the Senate. He exemplified a calm willingness to see virtually all of the three billion people on earth sacrificed to his notion of patriotism. Colin Gray, an arms control adviser to the Reagan administration, and Keith Payne(1980) argue nuclear strategy in the last segment. Such statements are frightening. Language is abstract and can become sanitized, never giving access to the images of war. Also, the learning process is removed from the reality of nuclear war where language is more of the focus than the weapons, wars, and human misery behind the words. "Nukespeak" offers escape from thinking of oneself as a victim of nuclear war by virtue of one's linguistic stance. In learning the language, Cohn states that one goes from being the passive, impotent victim to being the proficient, shrewd, strong steward of nuclear threats and nuclear explosive power. The immense destructive effects of nuclear weapons systems become extensions of the self, rather than threats to it. [47] Chilton mentions that this kind of talk has helped to bring us to terms with the invention of the bomb.[48] It is a dangerous game to play in the nuclear age.

Supports a negative resolution of cognitive dissonance

An especially strong motivation for thinking arises from what Leon Festinger (1957) calls cognitive dissonance - a state of affairs that occurs whenever two ideas are in marked conflict. When a supporter of these weapons is presented with their enormous destructive power but, on the other hand, this same person believes he/she is a good, kind, loving person, he/she will be strongly motivated to reduce such cognitive conflict. Most likely one will either change attitudes, seek more information, or restructure the information available to him/her.[49] The use of "nukespeak" makes the third option possible, likely, and perilous. It never ceases to amaze me how few people seek more information, and this is particularly evident on the college campus!

Supports group narcissism

A major psychological drive behind all stated superficial reasons for aggression is the effort to maximize individual and group power, grounded in a pervasive human trait - narcissism - the individual's unrealistically high evaluation of the power and virtue of himself and his group.[50] A person, to the extent to which one is narcissistic, has a double standard of perception. Only the person and what pertains to oneself has significance, while the rest of the world is more or less weightless or colorless. Because of this double standard the narcissistic person shows severe defects in judgment and lacks the ability to be objective.[51]

In group narcissism the assertion that my country is the most wonderful, the most cultured, the most powerful, the most peace-loving, does not sound crazy; on the contrary, it sounds like the expression of patriotism, faith, and loyalty. It also appears to be a realistic and rational value judgment because it is shared by others of the same group. This agreement succeeds in changing the phantasy into reality, since for most people reality is formed by general consensus and not based on reason or critical evaluation.[52] Anything that threatens this drive toward power is seen as menacing the national interest.

Leaders and nations often seek to hide their drive for power from themselves and others by appealing to moral pride- the duty to impose their superior world view and moral values on others.[53] People are moral creatures: unfortunately, moral scruples prove too often an easily surmountable barrier. The authority of moral directives is ofttimes limited to relations within one's own group. The out-group is typically entitled to no such courtesy. [54]

Group narcissism makes manipulation by language easier by appealing to narcissistic prejudices. The narcissistic image of one's own group is raised to its highest point, while the devaluation of the opposing group sinks to the owest.[55] As mentioned earlier, the choice of names for weapons systems is no trivial matter. This theme can be exemplified by referring to Graph 1 and noticing that there are 17 god and hero names and 2 meaningless names for our nuclear weapons while, on the other hand, there are no god and hero names for the Soviet weapons but there are 38 meaningless names. (Appendixes 5 and 6)

Supports necrophilia.

Erich Fromm and Michael Maccoby tested the validity of their hypothesis about the existence of a "necrophilous" character trait (an attraction to what is dead and putrid). Their analysis established the presence of a necrophilous syndrome, that life-loving (biophilia) and necrophilous tendencies could be measured, and that these tendencies were, in fact, significantly correlated with sociopolitical undertakings. They further stated that about 10 to 15 percent of the samples interviewed were predominantly necrophilous. One indication of the necrophilous character is the belief that the one way to solve a conflict is by force and violence. They usually fail to see other alternatives that require no destruction, nor do they discern how ineffectual force has often proved to be in the long run.[56]

Erich Fromm (1973) continues this theme in noting a connection between necrophilia and the worship of speed and the machine. The twentieth century necrophiliac is attracted to "clean, shining machines." They even give our weapons a "loving nickname." The reality behind this sanitary front becomes increasingly clear when we start listening to "nukespeak" and talk of preparation for nuclear war. If we had no cognizance of the possible danger, we might be absolved from responsibility. But it is the necrophilous element in one's character that prevents us from making use of the knowledge we have. Those in charge go on in the chase of technical progress and are willing to eradicate all life in the worship of their idol.[57]

There is no fixed border between the necrophilous and the biophilous orientation. As with most other character traits, there are as many combinations as there are people. It is quite possible to distinguish between predominantly necrophilous and predominantly biophilous persons. Some methods that Fromm and Maccoby used for discovering the necrophilous character were choice of words and general philosophy. For example, the language of the necrophilous person is characterized by the predominant use of words referring to destruction and to feces.[58] Only in partial joking do I note that every time you turn around there is another BM system: ICBM (intercontinental ballistic missile), SLBM (submarine launched ballistic missile), IRBM (intermediate range ballistic missile), SRBM (short range ballistic missile), and ABM (antiballistic missile)! But in absolute seriousness, the quotes from Senator Russell, Colin Gray, and Keith Payne can certainly be in the spirit of necrophilia.

Supports unrealistic fear

Although motives and perceptions are different in their essence, they are so closely connected that as a rule neither can be understood without some reference to the other. Fear is an extremely strong motive in international affairs and can be an extremely destructive one. It is probably the main motive that pushes forward the nuclear arms race. Is it a motive or a perception? Obviously, it is both. When we speak of exaggerated fear we are focusing on its perceptual side: we are calling it a misperception. The perception of danger naturally comes first, but almost simultaneously with it there is an urge to avoid the danger either by escape or by attack. The perception and the impulse to action are so intimately bound together that we speak of them together as fear.[59]

The war-promoting nature of the diabolical enemy image is relatively clear: it fuels the arms race on both sides, and it increases the chances of defensively-motivated aggression on both sides. Societies generate images of the possible and then draw their behavior from those images.[60] For the majority of people there is a kind of knee-jerk reaction against everything that seems to resemble dangerous weakness or lack of patriotism.

Chilton notes that the Cold War's image is one of two factions opposing one another- the Eagle and the Bear. In order to see how this is ideologically stacked, one needs to consider the diverse characteristics of these two entities: one soars to the skies, is wise, and all-seeing; the other is heavy, clumsy, stupid, and half blind.[61] The bear has been known to attack people: the eagle never does.

Conclusion

It is difficult to find the locus of responsibility for aggression in our technologically sophisticated age. Obviously, language is not the whole problem, but it is one significant ingredient and clue. All who are concerned about nuclear weaponry and nuclear war must give careful attention to this specialized language.[62] Far from being simply a technique of communication, language is itself a way of directing the perceptions of its speakers and it provides for them habitual modes of analyzing experience into significant categories.[63]

Human history can be viewed as the story of societies learning to manage conflict in ever-larger circles of interdependence, first through clan and tribal forms of governance, then in city-states ancd kingdoms, and finally through the nation-state system. We are now at a stage in history where conflict management needs to be taken to the next level. The individual must extend his narcissism to humanity itself. The age when nations can provide security for their citizens solely from within their territorial borders is dying.[64] The future of civilization, perhaps even that of the human race, hinges on our ability to avoid nuclear war. This point has been made so repeatedly and, on occasion, so eloquently that it needs no amplification here.

Language must begin to reflect this. National security has now become synonymous with world security. Peace and security are inseparable. Instead of talking about "national security," why not "common security" or "world security"? Why can't we turn the arms race into a "peace race"?[65] We need to develop more appropriate language based on mutual survival and cooperation rather than "mutual assured destruction." This connotes a world perspective that is more appropriate to today's reality.

A two-fold undertaking is suggested by Cohn: a deconstructive project along with a reconstructive one. First, "nukespeak" needs to be challenged so that some of its power to define what we hear and how we name the world is lost. We need to look below the surface of its jargon and unmask it for what it is. There is an intrinsic dilemma: learning the language is a transformative process. As Cohn acknowledges, you are not simply adding new information, new vocabulary, but entering a new mode of thinking - theirs. We can not allow this to entrap us. We must ask questions that break through the numbing language and raise issues in human terms[66] and not let these concerns be dismissed as unprofessional, too emotional, naive, or idealistic.

Second, we need to reconstruct a new language, a new vision of possible futures[67] that demonstrates a new and more mature way of handling human conflict. For example, many of our leaders subscribe to the dictum "If you want peace, prepare for war." But history has shown that nations that prepare for war get war. A 1960 computer study reported in U.S. Military Review found that since 650 B.C. there have been 1,656 arms races. All but sixteen ended in war. The rest ended in economic collapse. In light of this evidence the dictum might be recast, "If you want peace, prepare for peace."[68] From this point on, we cannot afford to learn from repeated mistakes, as in a computer simulation. We need to grow up before it is too late: all nations must do it right forever.[69]

The seductions of "nukespeak" remain great, but to perpetuate the use of this language is dangerous. Chilton(1986) reminds us that "nukespeak" brings with it an aura of good faith advertising - something like cigarette advertising. Once people come to believe that cigarettes and missiles might be dangerous for your health, the manufacturers have to work harder to change or repress that belief.[70]

APPENDIX 1: NICKNAMES

Animals
(partial listing of both nuclear weapons and strategic defense)[71]

United States	Soviet Union
Hawk	Bison
Jaguar	Bear
Tomcat	Badger
Eagle	Bison
Hornet	Fishbad
Antelope	Fishpot
Chevaline	Hen house
Pave paws	Dog house
Sidewinder	Cat house
	Foxhound
	Foxbat

APPENDIX 2: NICKNAMES

Artifacts of human culture
(partial listing of both nuclear weapons and strategic defense)[71]

United States
Tomahawk
Cookie cutter
Lance
Delta Dart
Gadget
Trident
Mace

Soviet Union
Fulcrum
Blackjack
Fencer
Golf II
Scaleboard
Galosh
Fiddler
Firebar

APPENDIX 3: NICKNAMES

Human types and roles
(partial listing of both nuclear weapons and strategic defense)[71]

United States	Soviet Union
Honest John	Mike
Phantom	Yankee class
Sergeant	Victor III
Midgetman	Mainstay
Little boy	Fitter
Fat man	Saddler
Corporal	Flanker

APPENDIX 4: NICKNAMES

Derogatory and/or frightening
(partial listing of both nuclear weapons and strategic defense)[71]

United States
Tornado
Stealth
Stinger

Soviet Union
Backfire
Blinder
Typhoon
Scud
Flogger
Savage

APPENDIX 5: NICKNAMES

Gods and heroes

(partial listing of both nuclear weapons and strategic defense)[71]

United States	Soviet Union
Phoenix	
Patriot	
Poseidon	
Pluto	
Titan	
Minuteman	
Peacekeeper	
Hercules	
Lafayette	
Ben Franklin	
Pershing	
Buccaneer	
Atlas	
Polaris	
Jupiter	
Thor	
Skybolt	

APPENDIX 6: NICKNAMES

Meaningless
(partial listing of both nuclear weapons and strategic defense)[71]

United States
B-1B
B-52

Soviet Union
Akula
Sasin
Scarp
Sego
Flagon
SS-11
SS-13
SS-16
SS-17
SS-18
SS-19
SS-X-24
SS-X-25
SS-N-5
SS-N-6
SS-N-8
SS-N-17
SS-N-18
SS-N-20
SS-NX-23
SS-4
SS-20
SS-NX-21
AS-15
SSC-X-4
SS-NX-24
SA-1
SA-2
SA-3
SA-4
SA-5
SA-8
SA-9
SA-10
SA-11
SA-12
SA-13

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Language of Advertising and Critical Thinking

Gene Beyers

What would be the appropriate level of analysis of advertisements? (Is there one?) What conclusions can we draw regarding the meanings of ads? How might we use the concept 'context' to talk about different levels of analysis and meaning? Metaphorically, what language does advertising speak and what are our responses?

These questions stem from a consideration of what happens when we take a critical approach to advertising. When we look at advertising as an expression and reflection of the larger culture, do the ads yield deeper levels of meaning than when ads are located in the context of advertising as a business?

The terms 'critical thinking,' 'context,' and 'meaning' are used in the following way:

1. Critical thinking: identifying underlying assumptions/premises of position, perspective, and/or argument (context). Herein, critical thinking looks for the basic or core idea(s) which is (are) the basis for a coherent, organized viewpoint.

2. Context: the frame of organization which surrounds the thinker's concerns and in which the argument and meanings cohere. The frame, itself can change as a function of different core ideas which are the basis of the viewpoint expressed.

Contexts, themselves, can occur within larger contexts: for example, state, country, continent, and so forth. This illustrates the horizontal or spatial organization of contexts. However, the vertical organization of contexts into levels is the more interesting case: for example, a specific child's behavior, considered as part of a pattern of behavior, then as part of training for normal adult behavior, as a cultural norm, and finally, as a basic cultural value.

It should be apparent that the next deeper or broader level which occurs is a function of how thinkers decide to organize their thought. The frame chosen results in the reality that comes into focus and the meanings which follow.

3. Meaning: the meaning of any phenomenon (object of inquiry) depends on the context in which the phenomenon is located. And the context, in turn, follows from its core ideas.

Therefore, in the abstract, critical thinking can start at any point in the "conceptual series": meaning, context, core ideas. Once one concept is embued with content, for example, context of culture, then the question of how to embue the other concepts should ensue, for example, what are the relevant core ideas which underlie culture? The end result of this process would meet the definition of critical thinking.

Following is a schematic representation of different meanings of an "object" as a function of its different contextual locations and their underlying core ideas (assumptions). Moreover, each different framing (context) leads to a different set of issues.

Table 1

Ad (x) in Different Contexts

Context 1		Meaning 1		Issues
Sales tools	----->	(a) Practical (b) Credible	----->	Techniques of persuasion

Core idea/
Underlying
assumption:
Instrumental Rationality

Context 2		Meaning 2		Issues
Culture	----->	Ontology (nature of being a person in this society)	----->	(a) Credibility vs. Truth (b) Appearance vs. Reality

Core ideas/
Underlying
assumptions:
Basic Values of

(a) Instrumental Rationality[a]
(b) Materialism

[a] Reasoning as an instrument (means) in the service of conscious purpose (end) set by need, want, desire or planning. The ends served are given and not subject to rational inquiry.

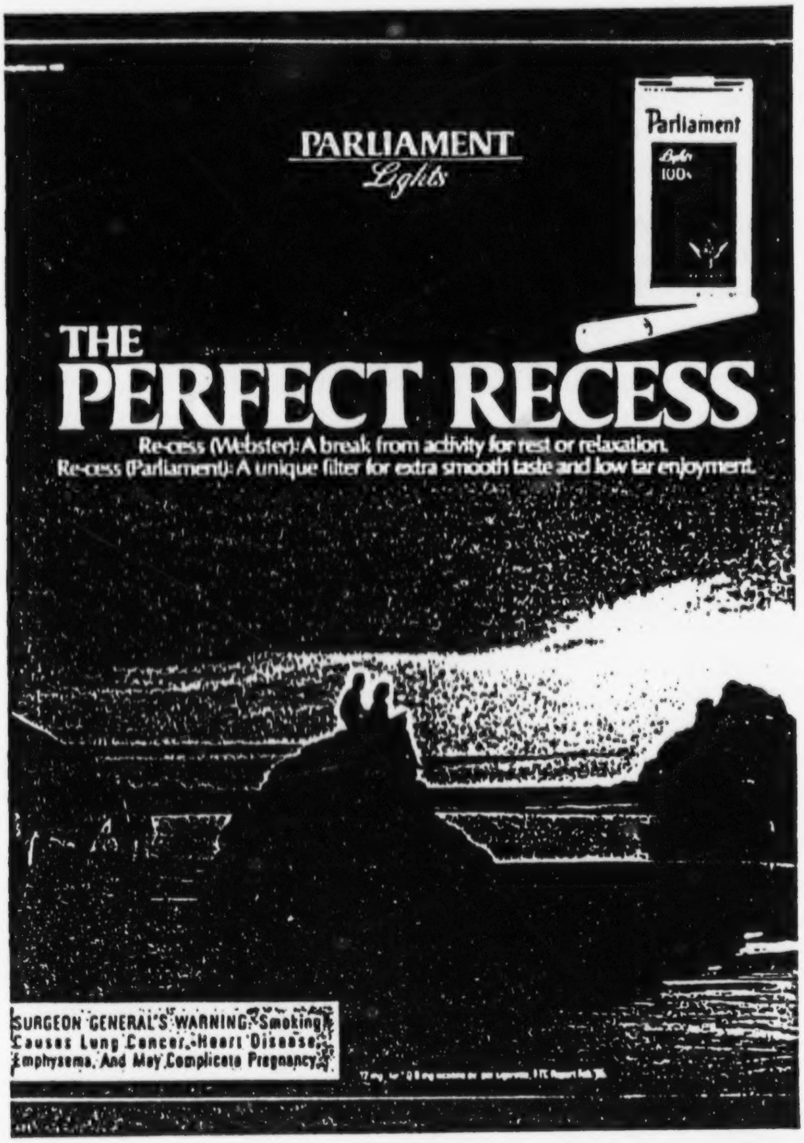
An important consideration here is that context 2, culture, is broader/deeper than context 1, sales tools. So, context 1 can be incorporated within context 2. Thus, context 1's meanings are subsumed under context 2 (culture) and consequently, may change.

Therefore, when we look at ads and their functions in the larger cultural context (subsuming context 1 and locating it in context 2), their meanings may change dramatically.

Looking at Two Ads in the Context of Culture

"Psychologies"

Parliment cigarettes had a series of print ads whose theme is "'Parliment's Perfect Recess'." [picture 1]



PARLIAMENT
Lights

Parliament
Lights
100's

THE PERFECT RECESS

Re-cess (Webster): A break from activity for rest or relaxation.
Re-cess (Parliament): A unique filter for extra smooth taste and low tar enjoyment.

SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, And May Complicate Pregnancy.

The ads take place in culturally idyllic settings in which happy, healthy, heterosexual couples are experiencing pleasure. (It's enough to take your breath away.)

We may identify the sets of elements which together contribute to an effective and, therefore, "successful" ad. They are:

(a) formal elements of color, layout, lighting, and so forth; for example, blues of sky, water, and cigarette package;

(b) word meanings; for example, "recess" as respite and as a kind of filter;

(c) cultural symbols; for example, the way a man and a woman are positioned as a sign of male protection; sunset and silhouetted couple suggesting a prelude to an evening of pleasure; and

(d) multiple reinforcement of meaning; for example; word "rest," sky and water suggesting calm and peacefulness, and nothing in the picture to disturb these smokers. Thus, the "Perfect Moment": everything is perfect -- nature, couple, and Parliaments.

Considered together, these sets of elements express the message of pleasure and promote a psychology of desire. And "naturally," the consumption of Parliaments is a pleasure by culturally ideal people -- you and me.

When this ad series is placed in the context of the culture, its cultural meaning can then be considered and interpreted: to "cement" in us a kind of psychology which has a marketplace function, that is, our desires fuel our economy. So what is considered a sales tool in context 1 may become a culturally relevant psychology in context 2.

Further thinking about cigarettes is to see that they clearly pose a health problem. But in these ads, their consumption is associated with healthy people and healthy behavior -- an interesting contradiction. In reality, a major association of cigarettes is to illness and/or death. (A less dramatic and more general case of association would be between the consumption of a product and behaviors which would not be in our *best interest*. Best interest is defined from an ontological perspective. [See the defintion of mystification.1]

---

1. Mystification: thinking we are acting in our best interest when we are not and not knowing this. Best interest is based on the ontological assumptions of what it means to be a person, one whose basic characteristics are being a center of orientation and an origin of action -- being a free person. Mystified persons would think they are behaving freely when they are not and not know it. This definition is derived from Laing (1967).

However, the ad is promoting a contradictory association for us to "believe": consumption of this product (in the general case, other products, too) is associated with pleasure. So, we are consuming a product which is not good for us, but we are encouraged to think the opposite. (No wonder the language spoken here is seductive.)

On the institutional level of society we can see how such contradictions are acceptable. They contribute to the gross national product, therefore, toward a high standard of living.

There is another contradiction as well. Does the consumption of a product's image (its association to pleasure) result in happiness or meaning *or* does it result in a false equation, a basic confusion between appearance and reality? If the latter is the case, then this confusion may result in false identifications and/or "understandings" of reality, that is, illusions. Are we being sold the illusion that we are consuming a product's associated meaning when all we are doing is consuming an object? (Does Pontiac actually deliver "excitement"?)

Do these kinds of contradictions affect people's consciousness/psychology in a way that contributes to the social order? A concept that could characterize such a consciousness is mystification.

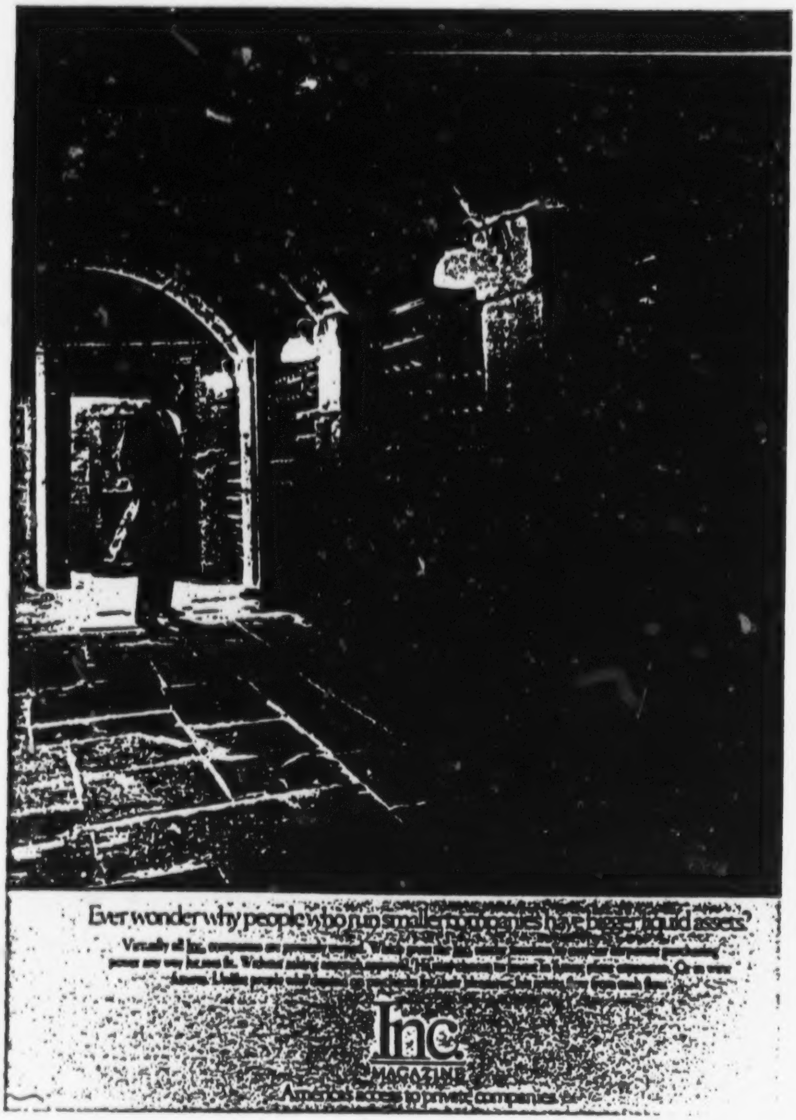
The typical social function of such a mystified consciousness would be to *not* see that one's sense of well-being is based on ontological confusion wherein illusions are mistaken for reality. This would be a false consciousness inured to its own falsity. This kind of consciousness would, in turn, support an economy that emphasizes growth in consumption as the paramount "virtue" at the expense of growth in awareness.

In this contextual analysis, so far, I have explored meanings of ads in the larger context of culture and their potential effects on members of the culture. The issues of ontological confusion and appearance vs. reality have been cited.

If context 1, advertising as a sales tool, is subsumed under context 2, culture, its meanings and issues become transformed. What are viewed as techniques of persuasion in context 1 become ways of promoting a psychology of false consciousness. What is pleasurable and useful becomes misleading and dangerous.

Moreover, if the core idea of context 1, instrumental rationality, is, too, subsumed under core ideas of the larger culture (basic values), how might we explore its now deeper/broader meaning?

A similar analysis can be made with respect to another print ad Inc. Magazine, the type of psychology it promotes and its function in the larger cultural context. [picture 2].


Ever wonder why people who run smaller companies have bigger liquid assets?
Inc.
MAGAZINE
America's access to private companies.

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Sets of elements of this ad to consider are:

a) formal elements; for example: lighting, exemplified by the lamps' casting a glow over the entire scene,

b) word meanings; for example: "liquid assets,"

c) cultural symbols; for example: slate floor and vaulted ceiling of cellar below suggest the mansion above; the man's posture and clothing reflect a man who is comfortable with his success, and

d) multiple reinforcement of meaning; for example: this man does not need to call attention to himself. Although he is not in the center of foreground of the scene, the sight lines "pull" the viewer to him and his meaning: the place is his and he has "bigger liquid assets." From a Freudian viewpoint he is a big, important man.

Taken together, these sets of elements express the message of status which promotes a *psychology of having.*

If we characterize the culture as a consumption-oriented one (a framing or contextual decision) then the two suggested psychologies can be viewed as functioning in the following "formula": (a) + (b) = (c) wherein:

a) is a psychology of desire,

b) is a psychology of having, and

c) is the *psychology of consumption.*

And this latter superordinate psychology integrates people into the economy.

Is this then the role of advertising in our culture? From the perspective of context 2, culture, advertising may have important socialization and mediational functions. It promotes a consciousness that we carry over to many life experiences beyond the domain of selling and buying. "Wanting to go for it" and "having it all" are contemporary parts of the "American Dream." Similarly, if we view advertising's core idea as instrumental rationality then we could look at its techniques and how they sell the product. When we view instrumental rationality as a basic value of the larger culture we would then expect it to permeate simultaneously our consciousness and social reality, for example, expressed as techniques of persuasion which "sell" things, people (politicians), and ideas in a social world where it is sensible to do so.

Therefore, what I have done is to look at the transformation of the meaning of advertising when placed in the deeper context of culture, that is, the practices of advertising result in a general psychological orientation -- how one views self, others, and the world.

Issue: Techniques of Persuasion and Manipulation

When we focus closely on techniques of persuasion in advertising in our culture, we can then identify an important issue: Do the meanings of *persuasion* and *manipulation* merge? An illustrative example of this issue follows.

Which one of the following ads is the most manipulative? And why?

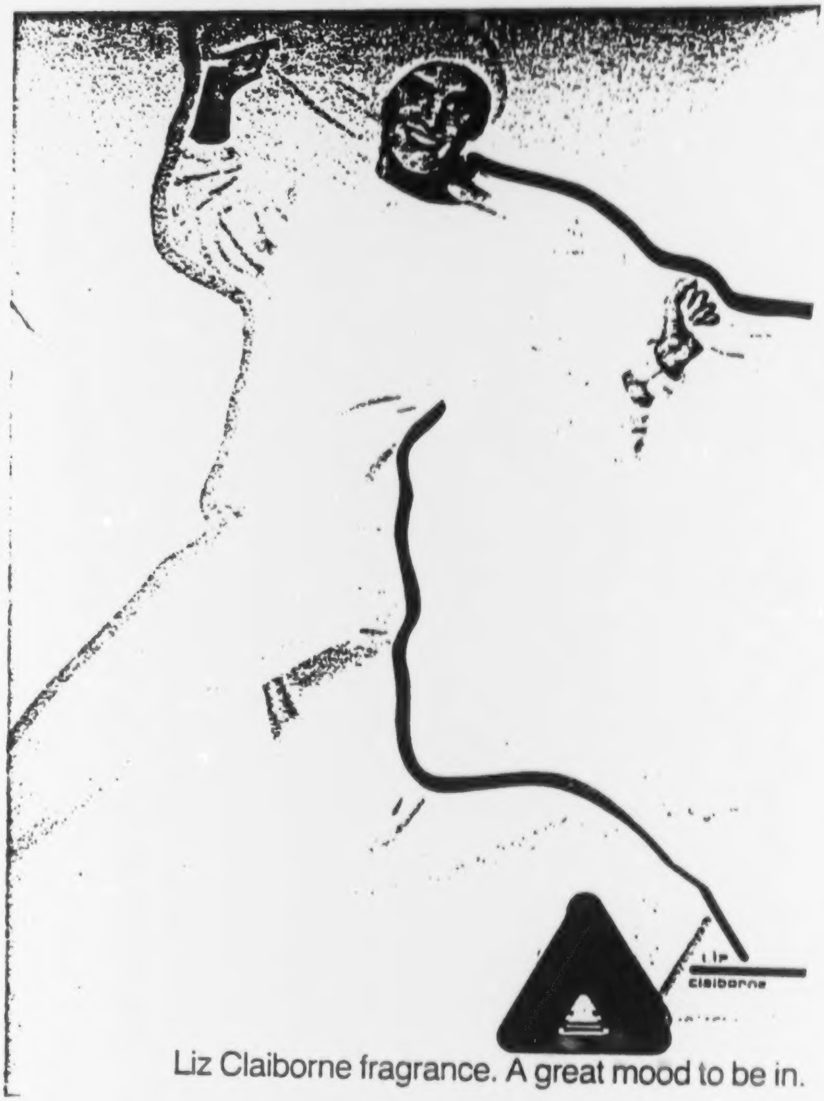
Two criteria for evaluation are offered:

1. How are the women in ads treated, that is, to what extent are they objectified?

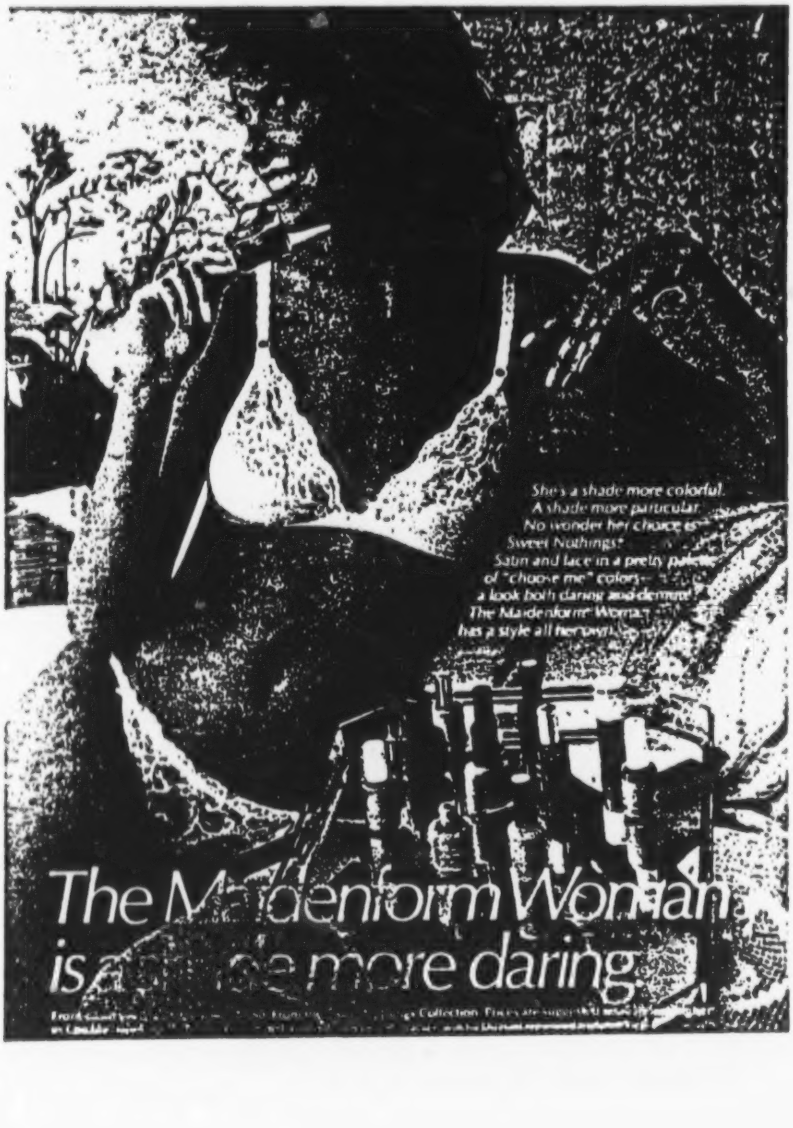
2. How are the viewers persuaded? If we are influenced in ways of which we are not aware, then are we being manipulated?

The following identifications and characterizations are offered;

1. Liz Clairborne body powder: a young woman is moving and dressed in a way that expresses youthful exuberance, confidence, naturalness, and health. (Watch out for the "healthy people" ads.) [picture 3]


Liz
claiborne
Liz Claiborne fragrance. A great mood to be in.

2. Maidenform bra: there seems to be an association promoted between use of the product and "being" the image of a sex kitten. Here is the time-tested "trite-and-true" idea of a woman consuming products that help her be some man's idea of an attractively passive object. [picture 4]



She's a shade more colorful.
A shade more particular.
No wonder her choice is
Sweet Nothings.®
Satin and lace in a pretty palette
of "choose me" colors—
a look both daring and demure!
The Maidenform® Woman
has a style all her own.

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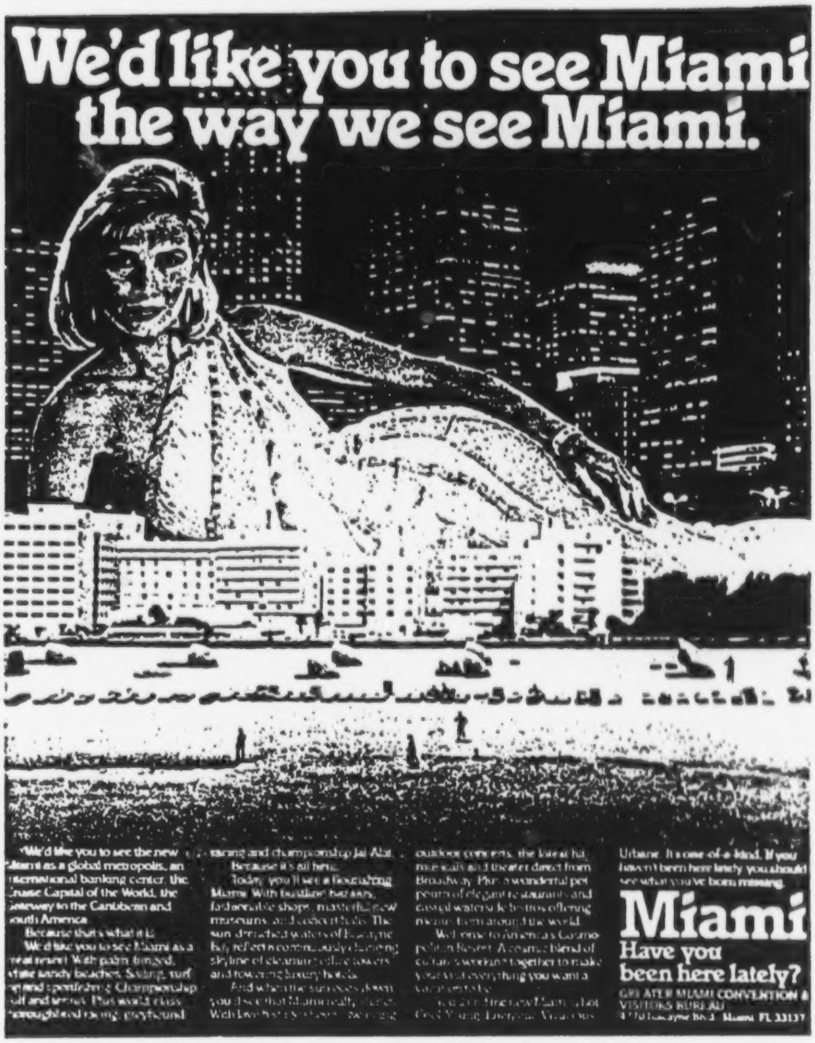
3. Miami tourist board ad: a glamorous, alluring woman is a backdrop for Miami's skyline -- the promise of nocturnal excitement. Larger than King Kong, the woman's pose is the stereotypical "ready position." of a willing sex object. Presumably, she gives meaning to Miami. [picture 5]


We'd like you to see Miami the way we see Miami.
Miami
Have you been here lately?
GREATER MIAMI CONVENTION & VISITORS BUREAU

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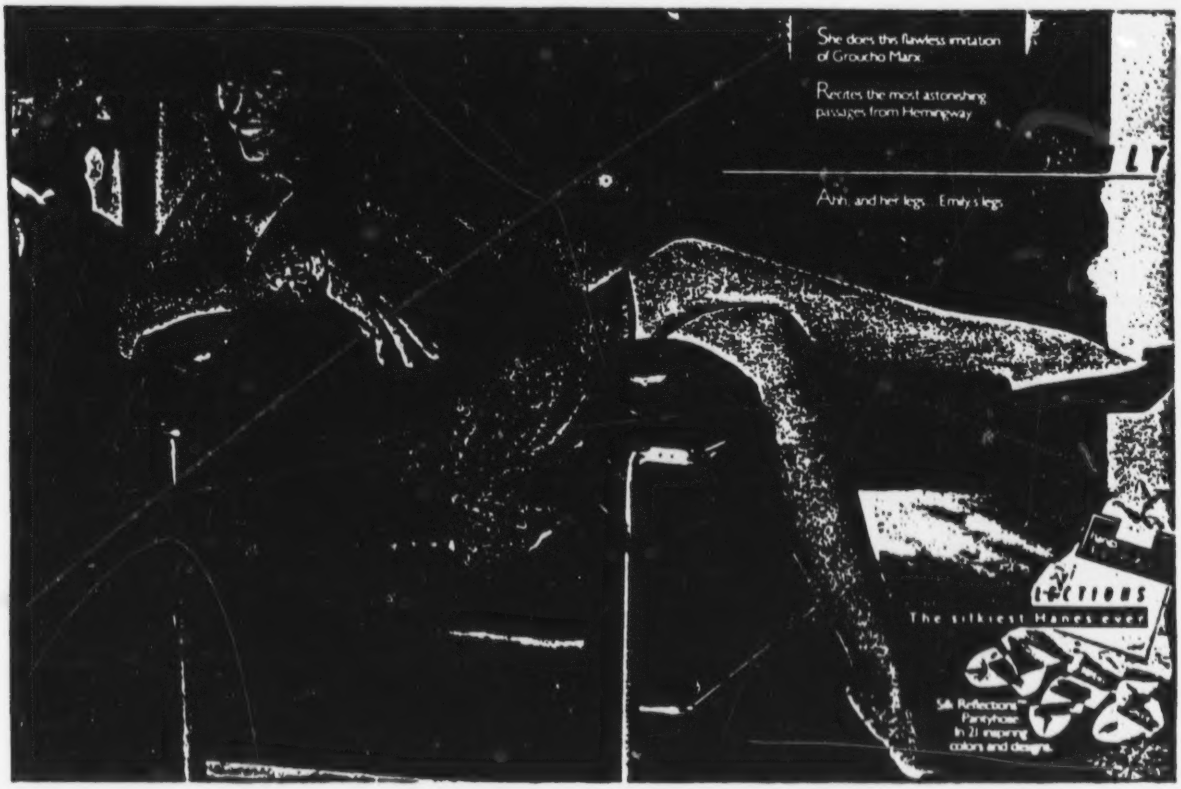
4. Hanes stockings: the "new" woman is smart and sexy. But read the fine print and measure the proportion of her "leggy" look to the rest of the ad space. [picture 6]



She does this flawless imitation of Groucho Marx.

Recites the most astonishing passages from Hemingway.

Ahh, and her legs... Emily's legs.

Silk Reflections™ Pantyhose In 21 inspiring colors and designs.

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Each ad attempts to persuade the consumer to buy what it offers. There seems to be varying degrees of objectification of women -- the greater the degree of objectification, the greater the advertiser's attempt at manipulation? What about the receptivity of the viewer to the ad's message? Is the first ad *most* manipulative because it conveys a potent message below the viewers' level of awareness? Note the product colors and how they envelop the model. Without these colors her body would not be outlined (packaged) and she would disappear -- become a cipher, a "real" nothing. Is she nothing without participating in the self-packaging promoted by the ad? Are women encouraged to believe in themselves when packaged in such culturally approved ways?

Using the second criterion of manipulation, a key issue is raised: influence (persuasion) without the receiver's awareness. This is manipulative because its effectiveness is due to bypassing consciousness: real choice does not exist. From the perspective of advertising as a business, this is a smart use of a tool. In the context of culture is it equally smart (instrumentally rational) to manage impressions, place others in lower power positions without their knowledge, and send flowers as a stand-in for feelings or other personal messages? What is a business technique of persuasion can become a cultural value of manipulating people for one's own gain in many kinds of life situations. And is the more successful manipulation then experienced as the more "sincere" message?

In the context of a conference on critical thinking, a last question is raised. Do you "buy" any of these ideas? Does that depend on how you view them?

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Using Advertising to Teach Critical Thinking and Writing

Carol Hovanec

My colleagues are often surprised when I tell them that I use advertising to teach logic and rhetoric in my freshman English classes, yet I am convinced that this most common element in our society is one of the most effective means to help students recognize persuasive devices and gain a sense of audience.

My unit on advertising begins with definitions, analysis, and practice of the familiar logical fallacies such as syllogism, causation, argument by authority, and others, One class period is usually sufficient to introduce them to the concepts, since reinforcement will occur in subsequent workshops. The next step is to teach them to read the visual and verbal messages conveyed in advertisements carefully. Such study must begin with a consideration of basic photographic design.

A picture is read in exactly the same manner as a page of print, from the top left to the bottom right. For this reason, the majority of advertisers ensure that the eye is not diverted but led by key elements of lighting, color, or sharp diagonal lines to the product name which is in the majority of cases in this key position.

The basic background lines possess inherent psychological characteristics. The horizontal is a cool, restful line. Verticals create a barrier; and diagonals stimulate. Irregular lines, because of their difference, are considered the most artistic. With shapes, the circle symbolizes completeness, perfection, eternity. The square is a restful counterpoint; the triangle the most active.

Just as important as line is color, and a rich symbolism has developed over the centuries. Meanings attached to color vary from culture to culture and have changed through time. But in western society there are certain constants, of which advertisers must be cognizant. Of course, cool colors such as blue and green suggest restfulness, but also traditionally blue has been associated with Christian religious feeling, devotion and innocence (it was the Virgin's color, used for her garments in medieval art). Green, on the other hand, was linked to Venus and nature, therefore hinting at fertility, as well as sympathy and adaptability. Of the warm hues, red, the color of blood, bespoke activity and passion, and surging emotion. Yellow, attributed to Apollo the sun god, indicated magnanimity, intuition, and intellect. Other associations placed gray with depression, inertia, and indifference, purple with power, and pink with sensuality. Gold and silver, of course, are most often thought of in relation to the sun and moon as well as precious metals which bear their name. Black and white are very complicated. In many civilizations they are conceived of as representing opposed symbols of the positive and negative, or duality. Black, generally, represents the initial, germinal stage of all processes, inner zones, the earth mother, but also time. White speaks of the spirit, mystic illumination, purity, but also death. In addition to the basic design and color, postures and expressions and positioning of models, settings and props convey subliminal messages.

Torben Vestergard and Kim Schroeder in *The Language of Advertising* say that what one sees in an ad is "less explicit than the verbal text, on the other hand, it has the advantage of being able to communicate more things at one and the same time." It is crucial to teach our students to recognize that they are being swayed by devices which they may have taken for granted.

The verbal element is, of course, just as important as the visual in advertising even though, in the majority of cases today the latter seems to have gained in importance. At the turn of the century a typical promotion used drawings, not photographs, and copy accounted, on the average, for nine-tenths of the space utilized. Now the reverse is the case, except for products whose advantages are detailed for specialized audiences, who will be convinced only by straightforward, technical information. But the majority of advertisements do not fall in this category. They have a minimum of text, highly condensed yet charged with persuasive language to convince a naive reader or viewer to buy a product he or she probably does not need -- or if a need does exist, is in no way different from the competitor's.

Examining this language can be important both to detect errors in logic as well as the values important in contemporary society. The most important aspect is the headline, where hyperbole is common with words such as "now," "new," "improved." Sometimes the headline uses puns, parallelism, rhyme, unconventional spelling and other similar devices. The text, when some is present in addition to the headline, uses suggestive words, loaded with connotations, and condensed to limit the possibility of their being ignored. The word "buy" is rarely used, with the negative interrogative "isn't it time you tried" a frequent substitution which may suggest a shortcoming which the product can remedy. This tone as well as demonstrative pronouns such as "you" imply a shared experience.

Looking at examples in popular magazines, one sees that, as the authors above indicate, "most ads function on the level of daydreams, constituting an imaginary world in which the reader is able to make come true those desires which remain unsatisfied." Unfortunately, this dream world presents a simplistic view of twentieth-century Americans, especially a dissatisfaction with the existing culture. "Ads overrepresent youth vs. age, leisure vs. work, beauty vs. ugliness." Advertising is very conservative, and although there has been some recognition that women can be intelligent professionals, the predominate vision is still of man as a forceful sexual animal, and woman as dependent and childish -- servant, Madonna, or prostitute.

A series of slides will show exactly how the previously-described aspects occur.

I. Slides for Line
Strong Diagonals> 1. Clinique 2. Marboro Horses
Restful Horizontals> 3.- 4. Merit
Verticals > 5. Merit
Irregular> 6. Liz Claiborne 6B. Marlboro Scene
Circles> 7. Kahlua

II. Slides for Color
Blue> 8. Lancome
Gold/Brown> 9. Lauren Luggage
Red> 10. More

III. Headlines
11. Vantage
12. Players
13. Baron
14. Metaxa
15. Ralph Lauren

IV. Copy
16. Oil of Olay>The circle represents completeness, cream color-- white and pink suggest youth and purity, therefore innocence. Words promise a miracle -- ritual, extraordinary, restore, bring back, recreate.
17. Aziza> words such as "spoils," "rich," " precious," " luxurious" "indulge."
18. Gucci> persuasion is in the picture; copy is straightforward.

V. Fallacies
19. Marlboro Man> non-sequitur, syllogism
20. Smirnoff> Post hoc
21. Elizabeth Taylor and 22. Denis Connor> Ad Hominen
23. Cigarette> questionable statistics

VI. Values
24. Candies> dream world, surrealistic
25. Carrera Sunglasses> ditto
26. Love Cosmetics> childlike view of women
27. Jontue> innocence and sexuality
28. Floor wax> woman as servant
29. Bathing Suit> woman as prostitute
30. Tequila> ditto
31. Stacks> ditto

Handouts:

After a lesson explaining fallacies and another showing slides, I ask students to bring an advertisement to class, one which illustrates a fallacy or has illogical details. The workshop requires students to examine the ads and pick out the one which best fulfills the assignment. The at-home assignment asks them to write letters, analyzing the ad, to the editor of the periodical where the promotion occurred. These letters are evaluated in the next class period, again by groups, who pretend they are the editorial board of the periodical who have the task of choosing the most effective submission to include in an upcoming edition.

In conclusion, I feel the use of advertisements adds immediacy, interest, and reinforcement of previous instruction not possible with textbooks or other material.

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Reasoning in the Language of Television

Lenore Langsdorf

Much of what we currently practice and teach under the rubric of critical thinking is rooted in a literate culture which is familiar and comfortable to teachers. Recognizing that context leads me to ask some basic questions. First: how much of what we teach and encourage in the way of reasoning in the verbal context of the classroom transfers to other contexts? Also: how much of logic and informal logic is rooted in structures of written language which do not correlate directly with those of oral or audiovisual language? This identification of three distinct languages--audiovisual, oral, and written--depends upon a thesis argued by several researchers during the past forty years. Harold Innis, Eric Havelock, and Walter Ong have argued that change from oral to written communication and from handwriting to print isn't simply a matter of alteration in the form of communication. Rather, they are manifestations of major cultural changes. Marshall McLuhan took that thesis another step further when he proposed that television was replacing typography as our fundamental means of communication.[1]

If the thesis proposed by these four researchers is correct, we should expect that differences in how we communicate would be accompanied by differences in how we reason. For patterns of reasoning are as much a part of communication as are people, grammar, and vocabulary. Indeed, one way to understand the nature of reasoning is to compare it to grammar.[2] We all use a grammar when we speak; classroom teaching aims at improving it, not teaching it from scratch. All languages have a grammar, certain persistent features can be noticed when comparing several of them, and some theorists argue that human being is intrinsically capable of using those structures.[3] I've found that my own experience in learning a second language is a common one: learning German grammar increased my understanding of English grammar. I believe that learning German even improved my ability to communicate in English. Yet many of us who acknowledge that transfer of abilities occurs between two verbal languages are reluctant to acknowledge correlative transfer between, say, musical and verbal expression. (Every school board that eliminates music in the name of economics and/or getting "back to basics" provides evidence of that reluctance.)

Some of us do recognize--or perhaps, just hope--that reasoning in a formal system such as math or logic will transfer to reasoning in everyday activities such as deciding what foods to eat, which candidate to vote for, or which job to choose. Yet very few of us are willing to entertain the notion that reasoning in other communicative systems, such as television, is different from but yet transferable to reasoning in the verbal language of our classrooms. That's the notion I want to propose here. There are two stages in that proposal. First: I rely on all that we know about acquiring, recognizing, and using grammatical structure in order to suggest that we acquire, recognize, and use logical structure in very much the same way. Communicating is what happens as we use grammar; reasoning is what happens as we use logic.[4] And just as communicating in music or visual art or body language is both like and unlike communicating in verbal language, I want to propose that reasoning in the language of television is both like and unlike reasoning in the language of words.

Now there is an increasing amount of evidence suggesting that the culture of verbal literacy is in decline, and that one of visual literacy is replacing it. Without entering into discussion of whether this is an admirable or deplorable change, I want here to consider its effects on reasoning. For it may well be that we bookish people--teachers--are engaged in our classrooms with students who are adept in understanding and assessing claims in accord with logic as embedded in the audiovisual language of television, rather than with logic as embedded in the verbal language of books. The importance of this difference may begin to appear when we consider that written English is a fourth language to many (and perhaps most) of our students. Typically, they learn to interpret the audiovisual language of television before they are adept at oral English. Almost always, they learn a language of bodily movement before they learn the language of television. But there may be only an insignificant time lag between becoming adept at what I call enactive communication and developing skill in interpreting audiovisual communication, and the sequence may even be reversed in the experience of some infants.

To summarize these remarks on language acquisition: our students typically come into the schools with developed skills in enactive, televisual, and oral communication. Some students begin school with rudimentary skill in reading, although not in writing. This means that communication in written language begins in the classroom. For many students it ends there too. Developing facility in written communication, then, involves difficulties comparable to those faced by students from homes in which a language other than English is the norm. Most teachers are acquainted with the special benefits and difficulties of a multilingual classroom, and are at least aware of the importance of respect for languages and cultures other than our own. But we rarely extend that sensitivity to televisual language and culture. Usually, we don't even consider the mixture of enactive, televisual, oral, and written languages as analagous to that of (for instance) Spanish, Vietnamese, and English.

My primary purpose in this paper is developing just that analogy. The second purpose is considering the implications of this linguistic plurality and the ascendency of televisual language, for the teaching of critical thinking. I begin that consideration from a conviction: Critical Thinking as an educational ideal should develop our students' (and our own) ability to reason in a broad or strong sense, across the languages employed by particular media, rather than confine itself to developing our ability to apply particular skills to isolated problems in a specific language.[5] This means that I don't equate critical thinking with either formal or informal logic. Both are useful for thinking critically in particular contexts. And it may well be that learning logic will help to develop skill in critical thinking. But I understand critical thinking as including logic, rather than being logic. Along with that indication of what I don't mean by critical thinking, I should offer a positive characterization. For I notice here, as at other conferences, that conceptions of what critical thinking is vary from one presenter to the next. Indeed it seems that the question, what is critical thinking, would get as many answers as there are people in the room when it's asked. In the great tradition of verbal literacy, then, I'll begin by defining that term.

By critical thinking I mean the ability to understand and evaluate claims so as to determine what to do or what to believe on the basis of reason and evidence, rather than on the basis of force, chance, or custom. Two aspects of this definition need a few words of clarification. First: I am not implying that we can always employ reasoning. But I am implying that we sometimes can do so, and that what happens in a critical thinking classroom should empower students to use reasoning when they have the opportunity to do so. Also: my conception of critical thinking differs from others in that I emphasize the importance of interpretation in reasoning.

In other words: I stress recognizing and understanding claims as a condition for the possibility of evaluating them. It's in relation to the interpretive aspect of reasoning that sensitivity to different languages is especially important.[6] Language is the necessary medium for presenting claims, and claims are presented and developed differently in different linguistic media.[7] If our goal in teaching critical thinking is developing ability to reason in a multiplicity of languages--and even, in any medium--we need to consider how that happens in each of them. We cannot simply assume that reasoning in the typographic culture which is comfortable to bookish teachers is retained in the televisual culture favored by our students. Nor should we simply demand that non-bookish people adopt our culture if they want to think critically.

Insofar as our goal is developing reasoning abilities that transfer from the classroom to everyday life, we must start by recognizing and understanding the different languages of everyday life. We then need to think critically about this question: are the rules and principles of written language also operative in those other languages--namely, enaction, orality, and television? For if they are not--and I find that they are not--the reasoning skills that we teach cannot transfer outside of the very specialized culture of our classrooms. No amount of creative technique can overcome that cultural difference. Instead, we must consider whether reasoning, as we know it, is relevant to those other cultures. If we decide that it is, we face two tasks. First, we need to develop ways to communicate that conviction to students as one based in reason and evidence, rather than in our ethnocentric biases. If we don't do that, we are in the unfortunate position of saying to our students (in effect): if you want to be a critical thinker, do just what I say. Then, we need to develop ways to translate the values and methods of verbal reasoning into those of televisual language.

Our limited time here means that I'm beginning after that major question of whether reasoning as it's been practiced in bookish culture is relevant in televisual culture. In other words, all that follows must be understood within a hypothetical context: if reasoning as we have practiced it during the past two thousand years in a culture based on the written word is still valuable in a culture based on the televised image--then how shall we teach that old practice in this new medium? The first step in answering that question is discovering how these four media are alike, and how different.

The ancient evolution from the spoken to the written word provides our starting point. If the thesis developed by Harold Innis and Eric Havelock is correct, then print literacy was in its infancy when Aristotle formulated the logical rules and practices which we still use in teaching critical thinking. This is not to say that Greek culture was in its infancy or that the members of that culture reasoned inadequately. A distinctive architecture, visual and verbal artistry, and political structure had been developing around the eastern Mediterranean for about 1500 years. Innis and Havelock argue that this culture was transmitted orally. I go beyond that focus on orality to emphasize a still more basic mode of enacted, embodied communication. Both oral and enacted modes of communication required habits quite different from the dominant ones in print culture.

Let's consider, first, some differences between oral and written culture. When we bookish people want to know something, we look it up in an appropriate source. But the only appropriate source in ancient Greek culture was memory. Our information must be recorded in a variety of ways congenial to our variety of technologized storage systems. Information in an oral culture must be recorded in memorable ways. Actions performed by agents and told about in a rhythmic form do that, although abstract formulations using substantives do not.

Collective authorship over generations was able to retain information through processes of retelling. We rely on particular products--written texts, produced by one or a very few authors--rather than on processes with an indeterminately long list of contributors.[8]

The Platonic dialogues provide evidence for the shift between these two systems. Plato's text presents ideas and viewpoints that are ascribed to "Socrates," his conversation partners, and other individuals--both actual and imagined. The form is a predominately narrative one. But expository passages break up the flow of talk and action that comprises the narrative. This is especially the case in the dialogues that scholars think were written later in Plato's life. The strong correlation of these narratives to particular persons is documented by their titles: almost all are the names of major participants in the conversations they recount. The "Crito" gives some especially clear examples of how ideas are argued in conversational, rather than print, form. A brief reminder of the topic and context of the dialogue may be helpful as a preliminary to considering the forms of language used in them. The "Crito" is the middle text in a trilogy which tells us of the end of Socrates' life. The first in the series, the "Apology," is a courtroom drama: here Plato recounts Socrates' speech in defense of his life and against charges of religious, intellectual and vocational unorthodoxy. The "Phaedo" is a deathbed drama: here Plato, speaking as Phaedo, recounts the last of Socrates' conversations, his drinking of the hemlock, and his death.

Set between these courtroom and deathbed dramas is the "Crito," a jailhouse drama that involves only two actual participants. Crito comes to Socrates' cell early on the morning of the last full day of Socrates' life. His mission is to persuade Socrates to escape rather than die. Preparations have been made by the group of friends who see Socrates' acceptance of his death sentence as a waste, occasioned by an unjust verdict. Socrates does not accept or reject Crito's proposal at the outset. Rather, he requests help in considering it in a "disinterested" way--since Crito is "not going to die tomorrow" and thus is "not likely to be deceived by the circumstances."(47a) We would think that Crito is hardly "disinterested," since he certainly has come with the proposal and presumably has been instrumental in making preparations for the escape. But Socrates does not equate those actions which document Crito's engagement with an inability to consider the argument in a "disinterested" manner. I find this significant of Socrates' orientation within orality: he presumes that Crito's position--in the sense of his affirmation of abstract principles--is distinct from Crito's position--in the sense of his actual, spatiotemporal placement.

This ambiguity between the physical and conceptual senses of "position" depends upon facility in both enactive and verbal language. In other words: within enactive language physical position and movements communicate our intentions and convictions. Our actions speak. But the oral culture within which Socrates and Crito reasoned relied upon a distinction between speaker and spoken: the person is not the message. Without that understood differentiation there would be no basis for relying upon the wisdom of past generations. Each message would have only the authority of the intrinsically limited experience of the person who spoke it. Written language intensifies this distinction to the point of separation. We can read a text without attention to its author, and we institutionalize that ability in proscribing "ad hominum" reasoning as well as "argument from authority." That is to say: the rules of reasoning in the language of print specify that the message stands alone. Thinking critically in verbal language, and especially in the language of print, requires that we be disinterested in the person who proposes the claims under consideration. That limitation is possible in oral communication, which is to say, our attention can be focussed exclusively on the strength or validity of the argument itself. But there's far more tendency to consider the speaker as well as what's spoken, than there is to consider the writer as well as the written.

Socrates' response to Crito's proposal occurs orally, but it evokes both enactive and verbal modes of reasoning. Let's return to the plot in order to see that. Consideration of Crito's proposal begins as Socrates recalls that he (Socrates) has always been "guided by reason," and in particular by that reason "which in reflection appears to me to be the best."(46b) He then determines that Crito still agrees with some basic "propositions," such as, "that not life, but a good life, is to be chiefly valued."(48b) It's on this basis of explicit agreement on several propositions that they proceed to "argue the question of" whether Socrates "ought or ought not try to escape."(48c). The topic for consideration is, indeed, Crito's proposal. But the discussion centers on what Socrates has done throughout his life--namely, seek out the opinion of the few who are wise--and what he would have to do if he escaped--namely, cease engaging in that activity.

The argument in "Crito" does move from the particular issue of whether Socrates should escape from jail to the abstract level of "principles which were acknowledged"--by Crito throughout the conversation--"to be just."(50a) We would refer to textual and specifically legal precedent in making a case for the nature of obligation between the state and the citizen. But Socrates brings in a veritable chorus, named "The Laws," to present the case for understanding that relation on the model of the parent-child relationship. In other words: Socrates does not give us an abstract formulation of the principles needed to reason through this issue. Instead, those principles--"the Laws"--are brought in as participants in the conversation. They remind Socrates of his implicit agreement with them:

> he who has experience of the manner in which we order justice and administer the state, and still remains, has entered into an implied contract that he will do as we command him. (51e)

Physical action rather than verbal formulation is relied upon again when Socrates notes (at the end of the dialogue) that the personified Laws provide "a murmuring"; a "humming in my ears" that "prevents me from hearing any other."(54d) We have here no explicit statement of general principle, particular instance, and conclusion that could be rearranged in syllogistic form. Rather, we have examples of enacted reasoning: an indecipherable but unavoidable voice reminds Socrates of the contract he performed by his own bodily presence. In other words: the argument occurs in actions by agents, rather than in formulas or verbally formulated principles.

Two modes of communication are operative here. The first is enactive and embodied: Socrates' living in Athens, performing all of the very everyday actions of his life there, means that he accepts the rule of law. He can provide no oral argument against the statement made by his own actions over a long period of years. Crito came to the jail that morning prepared with several oral arguments. But they cannot refute the enacted argument embodied in Socrates' actions and the Laws' presence. More than two thousand years later, we read the dialogue and recognize that in the very writing of it, Plato contributed to replacing orality with print as the preferred means of formulating and transmitting information. The dialogue gives a great deal of evidence for Socrates' teaching as the end of orality as the prime mode of teaching. Eric Havelock's work has discussed that shift in great and fascinating detail. But implicit in his research, and in the dialogues as we look again at them as I've done here with "Crito," is the evidence of a still earlier culture: prelinguistic culture in which reasoning was performative, enacted in human action.

We don't have direct linguistic evidence of verbal reasoning coming to predominate over what I call enactive reasoning in the life of a culture. But we do have indirect evidence of the priority of enactive reasoning if we accept the principle that ontogeny recapitulates phylogeny: the history of an individual repeats the history of our species. We can observe the evolution of reasoning modes in the life of particular human beings by observing children's maturation. Human beings are able to see and move at birth. Our earliest reasoning is in activity and kinesthesis: we classify and serialize, conjoin and disjoin, and rely on transitivity before we use those logical operations in our discourse activities. We continue to use these structures of reasoning as we move into oral and then written culture. Verbal reasoning simply uses those abilities without recognizing their origins. We thus become so thoroughly unaware of enactive reasoning that even characterizing what someone does as a meaningful statement, as an argument, seems like an odd way to speak.[9] Yet we can glimpse prelinguistic, enactive reasoning when, for instance, Socrates' remaining in Athens is cited as an "implicit contract," and "the Laws" are ushered into the prison cell to participate in what may have been the last great oral argument in Greek culture. Written argument evokes a prior mode of communication as it relies upon what someone said. Oral argument also evokes a prior mode as it relies upon what someone did.

Typically, newly emergent forms of communication have enthusiasts who downplay the values of the older medium. But also, typically, detractors of the new form extoll the superiority of the old. I count Plato as at least an implicit enthusiast, since he is the author of these written dialogues. But their central character is an explicit detractor: we have, in the "Republic" and in the "Phaedrus," speeches which tell us of Socrates' misgivings in regard to the written word. In our classrooms we institutionalize other misgivings, for we don't countenance action as an appropriate means of argument. Limited remnants of enactive reasoning remain: I suggest that raising one's arm in a vote or extending it in a handshake, as well as drawing Venn diagrams, are such remnants. They evoke the linguistic prehistory of human beings, when statements could only be made and information could only be discovered by moving one's own body as well as the bodies that were objects of knowledge.

Orality retains more enactment than does the culture of print: we move our lips, make audible sounds, form gestures. But the primary task of teachers in the primary grades may be rooting out those remnants of enactive reasoning: children must learn to sit still, be quiet, keep their hands on the desk; then, to read silently and preferably without following the lines with their fingers. Writing does require more kinesthetic reasoning than does reading. But here again, the range and particularity (individuality) of those movements is limited: we can speak in almost any posture, and can understand a variety of accents and dialects, but only certain body postures and hand movements can be used if we are to produce legible handwriting or accurate typewriting. Even very recent changes that we typically see as progressive--as symbols of increased democratization and informality--intensify the classroom practice of separating embodied action from cognition and encouraging a homogeneous stillness rather than individual movements: in the classrooms of my own childhood, we stood to respond to questions; in the classrooms of my parents' childhood, students stood when the teacher entered.

Computer-aided instruction and composition on a wordprocessor bring with them many more new habits that minimize embodied action and the reasoning that composes kinesthetic movement into those actions: we *see* the monitor rather than *hold* the book; we *tap* on the keys rather than *grasp* and *move* the pencil in order to *form* signs; we "delete" with the same standard and minimal effort we use to "write," rather than by reaching for and using a different implement that requires radically different motions. The only aspects of contemporary educational experience in which bodily performance using enactive reasoning occurs are "physical education," "eating lunch," "changing classes," and "going to the restroom." These activities are amply marked as thoroughly separate from the print culture of the classroom in which reasoning is taught in verbal language.[10]

We can now consider the current shift from print to television against the background of the prehistoric evolution from enacted to oral reasoning and the ancient change from orality to print. The first thing to notice here is the rapidity of this most recent phase of evolution in communication. The historical evidence strongly suggests that the shift from orality to print occurred over several generations. Our current move from print to television has occurred so quickly that many classrooms have teachers whose childhoods were totally pre-televisual and comparatively saturated with enactive reasoning, together with children who are almost as totally post-typographical and comparatively unskilled in enactive reasoning. Almost all classrooms, even at the university level, combine teachers who are comfortable with print communication and students who receive most of their information through television. Typically, both groups fail to recogize enactive reasoning as a common basis that could unite them.

My claim that enactive reasoning can serve this function is based on coming to understand television as a variant of enactive communication, rather than as a novel form of non-rational entertainment or as a visual addition to oral communication.[11] I've mentioned several correlative features of those media in the course of considering the "Crito." Here is a list of what I believe are the major characteristics:

physical action	is	translated	into	verbal formulation
engagement	"	"	"	disinterest (distanciation)
performance	"	"	"	contemplation (deliberation)
participation	"	"	"	abstaction
particularity	"	"	"	generality (universality)
wholistic images	are	"	"	sequential words
actions by agents	"	"	"	impersonal propositions.

Television shares the characteristics of enaction. To be sure, there are important differences between those two media, just as there are important differences between oral and print communication. But for our purposes here, I focus on these similar features in order to propose that reasoning does occur in televisual engagement just as surely as it occurs prelinguistically, that it is a form of reasoning more akin to enaction than to verbality, and that both enactive and televisual reasoning are neglected and even denigrated by teachers who prefer verbal culture. Learning to reason in the language of television requires something of an about-face: we must learn to reason from wholes (images and narratives) to parts (embodied claims) rather than from parts (words and evidence) to wholes (verbal arguments).[12]

In proposing that we understand enactive and televisual reasoning as alternatives to verbal reasoning I'm not urging that we abandon print or reasoning as it's exemplified in that medium. Rather, I'm arguing that an ability to reason across the media--in action, orality, print, or television--is best developed from a basis which recognizes and respects their similarities and differences. Three analogies are useful for developing the sensitivity to media languages that are the first steps toward thinking critically across the media. The first is bicultural/bilingual education which strives to add to the student's primary culture, rather than replace it. The second is the common experience of travelers who come to see their native culture more clearly by experiencing another cultural environment. The third is the experience, often reported even by beginning students of a second language, of coming to appreciate the grammar and syntax of their primary language for the first time, by virtue of its contrast with the language they are learning.

Learning to reason in the language of television offers three advantages suggested by these analogies. First: we as teachers are relieved of the uncomfortably authoritarian need to say that students must abandon their primary culture if they are to succeed in ours. We are offering an extension when we teach verbal reasoning, rather than a replacement; an addition, rather than a subtraction. Second: learning the language of bookish culture enables access to dimensions of human experience that cannot be visually portrayed. Learning from other people's experience by talking with them is an accepted practice among students. Relying upon already developed enactive and televisual reasoning skill in learning to follow and construct reasoning in print extends that practice. Third: Becoming aware of the contributions of both syntax and vocabulary to the explicit arguments given in written texts can sensitize us to their visual correlates; which is to say that we can learn to recognize and interpret claims in televised texts. Just as in verbal text, interpretation is the first step toward understanding and evaluating televisual claims. When we become adept at these three steps, we are reasoning in the language of television.

Footnotes

1. The ideas I develop here draw upon the work of Eric Havelock, Harold Innis, Marshall McLuhan, and Walter Ong--as listed in the bibliography.

2. This is not a new idea. The understanding of communication, reasoning, and interpretation that I present here adapts the medieval trivium--grammar, logic, and rhetoric--to our educational context.

3. Current debate over whether reasoning is discipline-specific, whether it should be taught as a distinct subject or as embedded in various subject matters, and whether it should be taught in a formal or everyday language, would also benefit from considering reasoning as analogous to grammar.

4. This is to say that grammar (a structure of wholes and parts) and logic (ordered arrangement within that structure) are necesary, although not sufficient, conditions for communication and reasoning (respectively). Using "reasoning" as distinct from "logic," as I do here, I reflect a duality that's succinctly stated by Piaget:

> Logic . . . is not to be reduced, as some people would have it, to a system of notations inherent in speech or in any sort of language. It also consists of a system of operations (classifying, making series, making connections, making use of combinative or 'transformation groups,' etc.) . . . the source of these operations is to be found beyond language, in the general coordinations of action. (1971: 45)

I use "logic" here to refer to a "system of notations," and "reasoning" to refer to a "system of operations," with "operations" understood as processes rather than objects.

5. I use "strong" and "broad" equivalently, to refer to the conception of CT as reflective evaluation of claims and viewpoints, rather than as limited to analysis of arguments, that originates in Richard Paul (1982).

6. Sensitivity to different languages is also important in expressing (monologically or dialogically) the process and conclusions of our reasoning. I've set that rhetorical aspect of CT aside here in order to concentrate on the constitution of reasoning action in diverse media, but don't mean to imply dismissal through this separation of considerations.

7. This is not to say that verbal (alphabetic) language is necessary to reasoning. On the contrary: I find that the "reason and evidence" needed for thinking critically *includes* non-verbal linguistic reasoning. Phases of an individual's and a culture's life are dominated by reasoning that occurs non-linguistically. Our bodies and actions present evidence; other bodies (human and otherwise) which are the subject-matter of our reasoning also present evidence for and against particular actions. But we cannot *present* these *claims* to ourselves or others for consideration or evaluation, non-linguistically. In other words: we cannot abstract a claim from its context, generalize, or argue, without language. To set the issues of this paper into a broader context, then: I find that contemporary theories which hold that "there is nothing outside the text," and understand "text" as verbal text, suffer from ethnocentricity. They begin with a culture that has denied epistemic value to embodied reason and downplayed oral reasoning, while privileging reason and evidence as presented in written text. They remain within the biases of that cultural insistence. This is especially evident in the work of those theorists who argue explicitly for the priority of writing over speaking.

8. Indeed, the very concept of "authorship" is comprehensible only in relation to a written text. The difficulties involved in extending the concept are most readily noticed by asking: who is the "author" of a film? the scriptwriter, the director, the cinematographer, or the actors? The same uncertainty arises in relation to a symphony. Is the composer, the conductor, the musician, or the operator of the sound system to be identified as the "author"? Correlative questions can be asked about the "product." Is the symphony a musical score, or a performance, or what the composer envisaged (a singularly significant term) when composing? I'd suggest that we shouldn't confuse ways of speaking about these puzzles (e.g. "type" in contrast to "token") with coming to an understanding of the peculiar nature of written text.

9. Within philosophy we have elaborate theories of meaning and truth that relate only to verbality; even, only to print. I'm thinking here of theories of truth as a "property" of "statements"; that is, as a possession of abstract entities which are embodied in, but not identified with, sentences. Elaborate conventions of quotation marks--a device of print literacy--are used to differentiate these abstract entities from their oral embodiments. In

contrast, Heidegger gives us an understanding of truth as uncovering, of discovery in the context of being and acting, rather than of possession in the context of language and knowing. I find it no coincidence that he goes back to the presocratics in order to develop this nonlinguistic understanding of truth as metaphysical condition, rather than epistemological construction.

10. Separation of the cognitive and the physical in our educational practice and its extension into the workplace, politics, the church, and the home, suggests that we are an increasingly Cartesian culture even as our philosophers denounce Cartesianism and deconstruct the "subject" upon which that theory "stands." Here I can't do more than hint at the extensive analysis that demonstrates this division between mind/theory and body/practice. But I will mention one aspect of practice in the schools that indicates the sort of analysis I would offer: although classroom teachers are encouraged to be "facilitators" who themselves depend on the abstract authority of the written text, rather than maintain authority in their persons, human authorities predominate in P.E., the lunchroom, and the restrooms. There we have umpires, referrees, and monitors who punish unacceptable physical behavior; e.g. hitting or throwing the ball into the wrong place, moving before the moment designated by a sign, cutting in front of others on the serving line, smoking in the john.

11. Walter Ong characterizes television as "secondary orality"; I differ from him on this point. Chapter Five of my Media and the Evolution of Rationality: An Essay in the Praxiology of Communication (in preparation) includes a discussion of this divergence.

12. The turnaround is something of a reversal of Plato's recommendation in the Myth of the Cave.

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Critical Thinking In the Disciplines

Critical thinking across the disciplines requires that each field speak for itself, in its own language. In this section members of various fields identify and assess the criteria that constitute judgment in their areas of expertise. They explore basic structures of argumentation and offer analyses of crucial methodological judgments in the disciplines they represent. Petty discusses how literary critics can use the language of texts as an indicator of epistemological and ontological commitment. Browne and Kubasek demonstrate how the structure of legal reasoning qualifies the arguments offered. The two papers that follow, both on evaluation, show continuities and contrasts with the first two. D'Onofrio argues that language expresses the limits and presuppositions of evaluation, while Wood, speaking about evaluation in less linguistic terms, shows how conceptual limitations render current evaluation of thinking suspect. The two final papers present rather different views of critical thinking in the disciplines. Two disciplines that are heavily reliant on images demonstrate the esssential role of visual analysis and imagistic arguments in making sense of claims in the fields of anthropology and art criticism. Johnston and Smith-Allen exemplify the argumentation in these fields, by casting broad cultural and historical nets that capture the particulars of the art works they analyze.

The first paper, by George R. Petty Jr., *Evidentiality: Epistemological Structures in Academic Criticism*, points to the "conflict between the language of some academic criticism and its logical content." By examining the "evidential marking system" operating in recent literary criticism and through the careful analysis of examples, Petty attempts to show how "critical epistemologies based on traditional theories of literature... (may)... have to be abandoned."

The next paper demonstrates contrasts and continuities between critical thinking in the general sense and argumentation in the law. M. Neil Browne and Nancy Kubasek maintain that " critical thinking is propelled by the quest for improved conclusions; legal training is activated by the search for clever reasons." In their paper, *The Tension Between Critical Thinking and Legal Reasoning* they support this contention by showing how critical thinkers strive to support "reasoned opinion, chosen from among several potential arguments. Legal training, in contrast, prepares attorneys for quite a different decision-making activity - the selection and organization of an effective argument with a pre-specified conclusion." Their paper has consequences both for the way critical thinkers look at the law and for claims that legal reasoning exemplifies the universal standards critical thinking theorists attempt to identify and justify. The paper also uses to show "how legal training both uses and abuses critical thinking."

Antonia D'Onofrio in her *Languages of Evaluation: The Pragmatics of Inquiry in Program Evaluation*, relates program evaluation to a rich context of "connotative meanings and transformations of meanings that are dependent on shared values of speakers, inflections arising from particular uses of language, and the rules of interpretation and utterance that determine meaning for a culture of speakers." Looking at program evaluation through a hermeneutic perspective enables D'Onofrio to raise questions of "perspective, paradigm, methods and data types" in order to explore the "intentions and needs of decision-makers whose underlying beliefs about how decisions should be made are reflected in the language of evaluations they espouse."

Addressing similar concerns, Carolyn M. Wood in her paper *Teaching Thinking and Measuring Competency: How Accountability Assessment Influences Curriculum and Instruction*, explores the extent to which standardized tests can offer an accurate index of "students' abilities to see relationships, to draw inferences and to make predictions, to evaluate information and lines of argument, to analyze and synthesize, to make reasoned judgments, and to recognize and use appropriate cognitive strategies." Her careful investigation results in the claim that such tests tell us little about such matters and "even less about those attitudes and dispositions which characterize critical thinkers." Her analysis forces us to give careful attention to such tests and their " overall structure and rationale as well as to item development practices."

The next paper, by Judith Johnston, *Mariamma Iconography*, demonstrates the epistemological criteria underlying judgments in cultural anthropology. Her analysis of "indigenously created murtis of Tamil Shaivite figures such as Kalbhairo, Munis Prem, Shiva and Durga in Sri Lanka, Guyana, Martinique, Nepal, Trinidad, India and Brooklyn provides insight into the visual consciousness of these East Indian communities and into the complex relationships beween popular Hinduism and Great Tradition." Drawing on an analogy with structural linguistics, Johnston takes "a positive view of these murtis as examples of social action/speech production." This view, rather than one characteristic of "a center/deviation model" helps the anthropologist to "reach a richer sense of the deeper meanings these precious visual forms convey."

The final paper in this section, *A Post-Modern Inquiry into the Language of Art Criticism* by Marytha Smith-Allen, is, once again, explicit in its attempt to display the criteria underlying criticism in a visual art, in particular those artistic and conceptual changes that reflect the movement from modernism to postmodernism. Using the notion of myth normatively, Smith-Allen presents "a reinterpretation of the language of art criticism to encompass the critical thinking aspects of synthesis and evaluation." Of particular interest from the point of view of critical thinking as standardly conceived is the presentation of her arguments with their essential use of the actual images found in the paintings that exemplify the critical shift she explores. Through the use of images, historical and conceptual analyses she examines "an expanded context of the synthesis, the interfusion of what we value artistically and aesthetically with an enlarged language that enscribes, shares, and enlightens those perceptions."

Evidentiality: Epistemological Structures in Academic Criticism

George R. Petty, Jr.

The enterprise of academic literary criticism is pushed toward change by European philosophers of language, by feminists within the institution and, of all things, by the government. As the profession considers the new theories, it continues to use the language and context for exchange of ideas that it adopted from European models a century ago.

At this juncture perhaps it might be useful to look at the relations between the language of academic criticism, its logic, and its modes of knowing the literary artwork to see whether in fact it represents a kind of critical thinking that should be preserved and encouraged among our cultural institutions.

I have been grateful for the opportunity to do this in an interdisciplinary environment through the Montclair State College Institute for Critical Thinking.

A recent collection of studies in many exotic languages, including English, suggests procedures for describing the general relationship between language and epistemology (Chafe and Nichols, 1987). The subject languages, including American Indian, Balkan, Tibetan, Japanese, Turkish, and unusual dialect mixtures like Chinese-Russian Pidgin and American English Academic, all have morphological or semantic structures called "evidentials" which delimit the epistemology of the native speakers.

In his essay "Evidentiality in English Conversation and Academic Writing," Chafe studied how the English language evidential marking system operates. He identifies four "modes of knowing": belief, in which the source of knowledge is unknown or unstated; induction, in which the source of knowledge is evidence either undefined or observed by the senses; hearsay, in which the source is a text or report in language; and deduction, in which the source is a hypothesis. Each of the four modes has characteristic expressions to mark its use in English. However, in English, unlike the other languages, there are several unmarked uses, in which the language makes assumptions about the evidentiality of statements. The interest of this study will derive from the application of this kind of analysis to the special discourse of academic literary criticism.

As data for such a trial investigation I have used an interpretive article by Bruce Hendrickson on Joseph Conrad's *The Nigger of the "Narcissus"* (TNOTN) in the October '88 issue of *PMLA*. I did this not because I am a specialist on Conrad, or because I expect all of you to know all about the subject. It just happened to be open in my hands when I decided to try this out, and I got too far into the analysis to give it up for something else.

Hendrickson, quoting the post-revolutionary Russian theorist Mikhail Bakhtin, asserts the theoretical ground of his study thus:

> Narrative study . . . must concern itself not merely with "private craftsmanship" but with "the social life of discourse outside the novel." These ends are accomplished by deconstructing the monologic or unitary narrative voice, hearing instead the many social or ideological voices . . . in the narrators's discourse.

He devotes about 500 words to establishing the acceptability of this theory to the academic critic, citing in the process ten different authorities from philosophy, the social sciences, and literary criticism whose writings support the idea.

After a brief nod to biographical support for the idea of Conrad as a conflicted narrator, the remainder of his essay is an examination of the text of TNOTN for evidence to support an interpretation of the narrative voice (voices) of the novel that is consistent with his hypothesis.

A search of Hendickson's text for Chafe's linguistic indicators of belief, expressions like "I think X," "I guess X," or "I suppose X," turns up none. This is consistent with the tradition of academic criticism, which has made a long and conscientious effort to rid itself of "impressionistic" criticism, and replace it with more rigorous models patterned after scientific investigations. This is not to say that beliefs, or opinions, do not occur in the text. They simply do not occur with the expected linguistic markers; linguistally there is not much difference between the expression of belief, opinion, and the the major premise of a deduction.

Deductive markers do occur, the majority of them signaling a logical sequence depending on the theory of Bakhtin described in the opening paragraphs. The following sentence is an example:

> This violation [of point of view], however, is readable as a troping of the ideological tensions in the social life of discourse surrounding and informing the novel and as a deconstruction of the unitary subject.
>
> The deduction implied here is something like
>
> MP All narrations follow Bakhtin's theory.
>
> mp This narration's peculiarities must follow it also.
>
> \# The changes in point of view can be read as an illustration of the theory.

Other markers of deduction include "can be," "may be read as," "could have been," "could not have been," "may well be," all of which signal the existence of an implied deduction in the text. The markers also carry obvious semantic comment about the (un)reliability of the deduction. It is true that these phrases do not always signal deduction. But their appearance indicates the possibility of an implied syllogism, which the interested reader may then look for and analyse.

Hearsay, in which knowledge comes through language rather than experience, has always been said to be the least reliable of all kinds of evidence. Many languages have special morphemes to signal that what is reported is second hand. In ordinary English speech we have the obvious hearsay markers like "people say," "they say," "so I'm told," and the like. Some markers have been borrowed from other evidential purposes to indicate hearsay. The phrase "I suppose" is found in Chaucer as a marker of opinion, but now in speech "I suppose" and other uses of the verb may mark hearsay evidence. "Apparently" was first found as a low level reliability marker for visual observation, but now marks hearsay in both speech and writing.

However, hearsay is a form of evidential found frequently in academic critical texts, where it turns up in citations of other critical texts. In fact, a popular genre of academic literary writing is the review of scholarship, in which the text is entirely subordinated to the citations of references. Chafe decides to exclude citations from his data since they aren't really linguistic evidentials of the sort he was describing.

The analysis of the evidential and rhetorical functions of academic footnotes could be a life's work, and perhaps worth trying. For the purposes of this article, however, I will discuss only one kind of citation, which refers to a conclusion or generalization needed for argument by the citer, and arrived at presumably by induction by the original writer. This type of hearsay citation will be included under inductive evidentials.

In Chafe's analysis of common speech and academic writing, induction is marked by such phases as "must," "obviously," and "seem to," which indicate inductive practices of decreasing reliability. Surprisingly, Chafe says the frequency of such markers is low, being 2.4 instances per thousand words for academic writing. In Hendrickson's article, about half of the sentences in the interpretive section either refer to or form part of inductive sequences. Only a small portion of them are marked as inductive evidentials, however.

Many of the inductive sentences are unmarked summaries of what would be in life experiences reports of sensory experience. Discussions of the exotic languages in Chafe's collection of essays indicate they all have special morphological markers to establish that a statement is based on sensory observation by the speaker. In English, Chafe points out, sensory observation is marked only by the semantic content of the verb, the most obvious cases being the verbs of the senses, "see," "hear," etc. He finds very few such markers in ordinary speech, and none in academic writing. From this he concludes that English speakers pre-suppose that "knowledge is factual much of the time, expressing it without any evidential qualification" (Chafe, *Academic*,271). For example, the statement "She's coming down the hall," is taken in English to be the report of a sensory observation, though there is no special linguistic mark to indicate the nature of the evidence.

This linguistic presumption becomes highly problematic when the writer must report or discuss his experience of a narrative or a poem. In academic criticism such unmarked summaries of perception must be considered inductive evidentials. Examples will be given below.

In Hendrickson's article the most prevalent "mode of knowing" is induction. Markers of induction in his text include "seems to," "suggests," "reveals," "reflects," and some words of repetition like "always," and "all." An example is the following sentence:

> "Such [individual and special] interests are suggested by the more individualistic tone of the "they" narrator, who seems to experience his own identity in opposition to the group" (Hendrickson,786).

This sentence implies that the critic has examined the entire text and determined that the "they" narrator is (characteristically) more individualistic than the "I" narrator, and that (usually) he feels himself to be different from the sailors he describes.

These generalizations about a field of narrative data happen to be marked with an evidential indicator of induction. But since English sentences of sensory perception need not have such markers, even unmarked generalizations about narrative data carry the same presumption of inductive procedure as the marked ones. Thus a sentence like

> His kinship with the earlier, "we" and "they" narrators arises from their all speaking for the interests of ownership rather than labor.

announces a conclusion from what the reader must suppose to have been a thorough examination of all the speeches of the three different narrators in the novel.

Sometimes a critic may follow a generalization with a series of sentences pointing out examples to support the assertion. This is "on-line" induction, and is particularly effective in establishing a presumption about the reliability of other "off-line" induction. For example, the following sequence illustrates "on-line" induction:

> The two social formations are in opposition throughout The Nigger of the "Narcissus." Individualism and special interests assert themselves when Belfast steals from the officers' table, when tools necessary for the maintenance of the ship are lost during the search for Wait, and when the helmsman leaves the wheel during the incipient mutiny (786).

Each of the subordinate clauses reports a perception of a narrative action in the same way that an unmarked report of life experience in English implies sensory perception by the speaker. The implication is that the generalization contained in the main clause developed by induction from the subordinated perceptions.

In ordinary speech the rapidity, care and tone of voice with which such a sentence is spoken may provide estimates of its reliability. But in academic literary criticism the institutional requirements for publication establish a presumption of exceptional care in providing support for such generalization from the text. A sentence such as

> Perhaps the "they" narrator is more individualistic than the "I."

implying that the writer isn't sure because he hasn't examined all the instances, or he has and their meaning isn't clear to him, is simply not a desirable (publishable) sentence in academic criticism.

The reference or footnote citation to other studies provides a way for the academic critic to make use of "off-line" induction. As in the case of in-text generalizations without data, there is no way for the inexpert to check their reliability. However, academic criticism is addressed to professionals who are presumed to be familiar with the current scholarship in their fields. A typical use of the off-line induction reference in Hendrickson's article is the following sentence:

> The thrust of this novel toward the final presentation of the "I" narrator is similar to the work Jameson discovers in his readings of Balzac, Gissing, and Conrad's Lord Jim and Nostromo, "the construction of the bourgeois subject in emergent capitalism (Political 12).

The logical purpose of this reference is to imply that Jameson has carefully examined the narratives of many novels of Conrad's era, and come to the conclusion quoted through inductive reasoning. Hendrickson then takes the conclusion as a major premise of high probability, and deduces from it the idea that TNOTN does the same thing, with further consequences for his interpretation.

Hendrickson makes use of off-line and in-text concealed induction in one sentence:

> While at sea -- as Conrad's intention is commonly understood -- the ship and its crew become a partially independent world with some chance for purity and community, but the enterprise is always tainted by its affiliation with the commercial interest of the land.

The words "commonly understood" refer to the established academic critical concensus about the meaning of the ship, an off-line induction already conducted by the whole history of Conrad scholarship. The word "always" linguistically implies an on-line induction for which data is not supplied. The issue for academic readers is to decide whether Hendrickson's revision of established concensus is a justifiable result of careful induction, or a tendential concealed deduction from his controlling theory.

Entirely apart from the problematics of the reliability of inductive evidentials, these practices introduce some larger considerations. Hendrickson's use of predominantly inductive language implies several assumptions about the epistemological status of a literary fiction.

> 1. The effect of the text of the novel is stable over time and space in its stimulation of perceptions: It has a status much like real experience, such that other perceivers elsewhere and in the future can be expected to find what Hendrickson found.
>
> 2. The narrative is mimetic; the logic and language used to manipulate life experience may (must) be used to interpret the novel.
>
> 3. The analysis of a novel may (must) use theories developed in connection with life experiences, and, conversely, the successful application of the theory to a novel supports the theory's validity in life experiences.

However, insofar as Hendrickson's theory precedes his interpretation and may condition the selection of data used in the inductive operations, he makes the following directly contradictory assumptions about the epistemological status of the narrative:

> 1. The interpretation of a novel proceeds deductively from a theory, which acts with its corollaries as major premise to the principal deductions leading to interpretation.

2. Since the literary fiction exists only in its relation to the interpretive theory, the text has little or no epistemological status at all, and cannot be primarily mimetic. The novel acquires its existence from the theoretical construct that governs the selection and priveleging of the data used for interpretation.

Hendrickson begins by proposing a theory of the self as produced by social forces external to the psyche, and proceeds to find reasons why the theory is appropriate for interpreting the text he examines. His interpretation of the novel is in fact at the service of his theory, as he himself acknowledges:

> But my larger purpose is to suggest, through specific analysis, how contemporary theories of the subject -- understood in their properly political dimension -- might encourage a general reorientation of our thinking about point of view and its relation to ideology (784).

In thus asking his interpretation to validate a theory, and seeking a theme in the novel consistent with his theory, Hendrickson is typical of a large portion of academic literary criticism of recent years.

Publications in professional journals indicate that academic conceptions of a literary text have been challenged by a post-structuralist epistemology, which can be succinctly summarized as "Human Experience is essentially linguistic" (Gadamer,19). Under this new pressure critical epistemologies based on traditional theories of literature, such as the concept of linguistic art as mimetic, or the author as inspired or self-sufficient creator, or the literary text as a self-sufficient ontology, would logically have to be abandoned.

Hendrickson's article illustrates this conflict without recognizing it or attempting a resolution. His use of language predominantly supports interpretive procedures derived from the scientific treatment of experience as data, and can easily be assimilated into the institution of academic criticism. His logical framework, however, requires a completely different view of the nature of a text, and undermines the inductive procedures he uses to support his interpretation.

The idea here is not to attack one position or the other, but to point to the conflict between the language of some academic criticism and its logical content. Other readers of academic criticism have noticed similar problems. I think here of Richard Levin's recent article on feminist interpretation of literature (Levin, "Feminist"), his earlier book on Hamlet criticism (Levin, Readings), and a recent dissertation on the logical absurdities of more traditional academic criticism (Haliburton).

Hendrickson's article demonstrates how modern theories of the social construction of meaning can be applied to the interpretation of literature using the traditional forms of argumentation developed by the profession over a century of institutional activity. But it also indicates that these theories may conflict with such argumentation in their "mode of knowing" the text.

The adoption of these new epistemologies of the text may entail finding new ways to write about them, and unstringing the complex web of citation now so central to the critical enterprise.

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The Tension Between Critical Thinking and Legal Reasoning

M. Neil Browne and Nancy K. Kubasek

The Tension Between Critical Thinking and Legal Reasoning

A superficial glance at legal reasoning convinces the observer that it represents just another disciplinary mode in which the skills of critical thinking are paramount. Logical, precise connections between facts and legal inferences are encouraged. The reasonableness of one's argument is a primary explicit criterion applied to legal briefs. Law students are taught to discover the analysis and reasoning in each case as a guide to understanding the eventual synthesis with diverse fact patterns. In addition, many legal scholars have eagerly jumped on the critical thinking bandwagon by alleging that they too are encouraging critical thinking in their classrooms.

Any harmony between critical thinking and legal reasoning cannot, however, withstand a comparison of praxis in the two domains. What even the best lawyers do represents a highly restricted form of critical thinking. Initially, this paper attempts to spell out the tension between critical thinking and legal reasoning.

The latter half illustrates this tension by analyzing the canons of "proof" in Roe v. Wade. If there is substantial harmony between critical thinking and legal reasoning, we should find in Roe v. Wade a mode of argument that conforms to the standards of critical thinking.

I. Do Lawyers Use Critical Thinking?

To ascertain whether lawyers use critical thinking, it is especially helpful to recall Richard Paul's distinction between weak and strong sense critical thinking. The use of evaluation skills to point out inadequacies in the reasoning of others constitutes weak sense critical thinking; applying the same skills to one's own arguments as well denotes strong sense critical thinking.

Alternatively, one can envision weak sense critical thinking as defending one's vested interests using evaluation skills. Strong sense critical thinking, in contrast, has a different purpose. In an attempt to discover a more reasonable opinion or solution, a strong sense critical thinker attempts to resist normal loyalty to current positions. To accomplish this self-censorial task, strong sense critical thinkers consciously apply evaluative criteria to all arguments, including their own favorites.

Surely all of us who have had the unpleasant experience of believing we were encouraging strong sense critical thinking, only to find that our students envisioned the critical thinking process quite differently. Many of our students are delighted to learn weak sense critical thinking as a guide to more effective persuasion or manipulation. Indeed there are many skills taught under the rubric, "critical thinking," that are highly useful to prospective advertisers, politicians, or scholars with vested interests. Imagine, for instance, what the artful advocate can do with the knowledge contained in Damer's *Attacking Faulty Reasoning* (1986).

Lawyers, like other professional advocates, recognize the efficacy of weak sense critical thinking. The Code of Professional Responsibility that guides lawyers in making ethical decisions implicitly sanctions weak sense critical thinking. Lawyers are required to "zealously represent" their clients. That representation does not include pointing out the erroneous nature of the client's arguments.

Lawyers are presented with a perspective and then are paid to represent it. Consequently, they are provided training in weak sense critical thinking as a device for ridiculing alternative perspectives. Clients are not paying for civic education, moral training, nor guidance toward truth; they seek victory! Good lawyers fulfill that objective.

Legal training, provides explicit coaching in reverse logic - conclusion first, then reasons - to enhance students' abilities to attack opponents' arguments. For instance, a recent text on legal tactics (Schlag and Skover, 1986) introduces its topic with the following implicit embrace of reverse logic or reason shopping:

> A legal argument can be seen as a series of "moves" designed to persuade the reader to accept a particular position. This book catalogues the "tactics" or "counter-moves" that are used routinely to attract legal arguments....It's up to you to persuade your audience.

That an opponent's arguments might be more reasonable than one's own is not the point. A good argument is one that sells in a particular context.

Donald McCloskey (1988) defends this legal criterion for judging the effectiveness of arguments as necessary "social reasoning." Analogy and reliance on precedent or authority are the common tools of legal reasoning (Levi, 1948) because they work so well. In his zeal to edulcorate legal reasoning, McCloskey defends *ad hominem* arguments, *argumentum ad baculum*, *argumentum ad verecundiam*, and *argumentum ad populum*. He terms criticism of such forms of rhetoric "logic-mongering." Only if "strong" argument is identical to "effective" argument, however, can we make much sense out of either McCloskey's analysis or the approach to critical thinking adopted by law schools.

Even legal scholars frequently embrace habits of mind that would earn a low grade in an undergraduate critical thinking course. Law review editors apparently regard the magnitude of footnotes as persuasive evidence of careful thought (Barrett, 1988). In what must be some kind of record for arguments from authority, Dean Jesse Choper of the University of California Law School recently listed 1,611 footnotes for a single article. That footnote mania "works" in terms of garnering acceptances makes more sense when one realizes that, with rare exceptions, the referees are students who are understandably impressed by a cascade of arguments from authority.

Nothing in the previous paragraph is meant in any way to disparage the quality of the minds of those who write in law reviews. In fact, even the briefest exposure to legal analysis suggests that legal scholars possess uncommon breadth and diligence. It would be most surprising, however, if those who encourage weak sense critical thinking in their classrooms could completely disassociate themselves from the same type of thinking when they attempt to build a publication record.

Strong sense critical thinking would obstruct most legal reasoning, particularly in situations where one is arguing on behalf of a client. Clients understandably want every possible "winning" argument to be made. They and their legal counsel are interested in identifying questionable contentions and assumptions in their own arguments only for purposes of preparing their rebuttals should opposing counsel be especially clever.

II. Roe v. Wade: What Is Persuasive in A Legal Context?

Despite numerous attempts to modify its ruling that women in their first trimester have a limited right to choose an abortion, Roe v. Wade has stood for fifteen years as the legal rule governing this ongoing dispute. What constituted convincing support for both Justice Blackmun's majority opinion and Justice Rehnquist's dissent? Is that support similar to modes of proof acceptable in a critical thinking classroom?

Blackmun offers several reasons to defend his decision that states may regulate abortion procedures during the first trimester only in ways reasonably related to maternal health.

1. History demonstrates that ideas about abortion have regularly changed. An extensive history of attitudes toward abortion is provided, apparently to provide justification for the further evolution Blackmun's decision would represent. Somehow we are supposed to be convinced that because others have changed their minds about abortion, Roe v. Wade's particular reification of this historical tendency is apt.

   That history reveals multiple instances where communities changed their minds about abortion hardly justifies particular prospective changes.

2. Numerous arguments from authority are cited throughout the decision. The reasoning responsible for the arguments is apparently not nearly as important as the number and impressiveness of the authorities.

   For instance, we are told that Aristotle and Plato commended abortion. In addition, one-third of the States had recently modified their abortion rules in directions consistent with Blackmun's holding. The American Medical Association, American Public Health Association, and the American Bar Association were all cited as supporters of the holding.

   In addition, as the appendix indicates, Blackmun provided dozens of legal citations that he claimed were consistent with his holding. Why he chose that group of citations, rather than numerous others that would push the reasoning in a different direction is not shared with us.

   The privacy right on which the decision depends is said to have "roots" in the First, Fourth, Fifth, and Fourteenth Amendments. Such an argument from authority would convince only those already convinced because others see no such "roots."

   Arguments from authority are often necessary. The speed with which a decision must be made or inaccessibility of the argument to the layperson might justify reliance on authorities. In the case of Roe v. Wade, however, neither of those rationales justifies the extent of the reliance on authorities as a substitute for thought.

3. Because the privacy right of the mother is "fundamental" and the state lacks a "compelling" interest during the first trimester, the holding is justified.

   From a rhetorical perspective, the use of "fundamental" and "compelling" are essential. Both are mandatory inclusions in the rationale for they constitute the persuasive vernacular of Constitutional Law in this domain.

   To the critical thinker such labels beg the question. The terms are conclusory - restatements of the conclusion, posing as reasons. Without clear standards concerning the denotation of such terms, they can be used willy-nilly to justify one's conclusions.

Judge Rehnquist responds by using the same mode of discourse. Unlike the majority, he claims the decision to abort is not private. He reaches this judgment by arbitrarily assuming that a fetus is a person. His "proof" takes the same form as that offered by Blackmun. He presents a long list of court cases that he claims are consistent with his views on privacy. Again, whatever reasoning is in these legal precedents apparently has less significance than the fact that there are numerous such precedents.

One leaves this exercise with a sense that weak sense critical thinking is the common currency of legal reasoning. The adversary model encourages the belief that one has little responsibility to wonder and reflect. One's task is to stick with a conclusion and persuade others to embrace it. If one can successfully argue, as both Blackmun and Rehnquist attempted, that most relevant authorities agree with you, then legal training encourages you to do so. That these authorities may have weak or strong reasons is less important than the prospect that citing them might create a bandwagon on behalf of the desired legal conclusion.

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Languages of Evaluation: The Pragmatics of Inquiry in Program Evaluation

Antonia D'Onofrio

The purpose of this paper is to map out the dimensions of program evaluation from the perspective of Pragmatic analysis. The role of program evaluators as envisioned in this paper includes the task of clarifying the working theories that decision makers espouse. In this role, evaluators tend to make explicit the tacit culture of social and political realities surrounding the evaluation; and clarify the type of language needed to communicate information for decision making. This paper also examines how the application of hermeneutic analysis permits evaluators to contrast decision making perspectives and paradigms for evaluation research.

Languages of evaluation

The meaning of language, spoken and written, in the more naive sense of semantics, associates graphic and vocalized representations of words and phrases to objects, actions or events having the possibility of immediate reference. However, from the perspective of Pragmatic theory, meanings refer to comprehensive frameworks that tie together the perceptual environment of words with the context of language use (Innis, 1987). This context includes, not only referential meanings, but also connotative meanings and transformations of meanings that are dependent on shared values of speakers, inflections arising from particular uses of language, and utterances that convey meaning for a culture of speakers (Hormann,1987).

These are some of the more accessible arguments made by the Pragmatic school of linguistic analysis that followed from the maxim of Wittgenstein, that the meaning of a word is in its use. Thus any culture of speakers may engage in uses of language that reflect underlying meanings current in that group and true for that group. As this paper claims to examine the languages of evaluation, it therefore also proposes there may be more than one culture of those who use evaluation language, having more than one purpose to serve in the communication of evaluation findings. Questions of perspective, paradigm and strategy can be used both to disclose the underlying intentions of decision makers, reflected in evaluation language, and to discern a distinctive lexicon of rules for selecting and applying one evaluation model rather than another.

Problems of perspective

Evaluation, unlike basic research, is always grounded in contextual problem solving. In fact the great trade-off made by evaluators --who rarely find themselves in a position to randomize treatments, select samples from populations, systematically control intervening variables, or develop reliable and valid instruments before the start of a study-- achieves an improved sense of realism that emerges from the design of an evaluation. Evaluation trades off precision and control in the hopes that realistic and ecologically valid interpretation will be both useful and used. Although normally considered neither a means of inquiry, nor a subject of pragmatic analysis, program evaluation may conversely be a fertile ground for pragmatic study because of its dependance on context.

Inside any context of decision making, nearly everyone knows exactly "what program evaluation means." Of course, it refers to the use of standardized tests that can determine program effectiveness. Wrong, it refers to the use of qualitative methods to assess levels of shared goals among participants in decision making. Wrong again, it refers to the use of cost-benefit analysis needed to investigate whether gains in achievement are justified by expenditures per student. Or again, it means none of these things. It can only mean the task of seeing whether teaching and resource allocation meet criterion levels of success toward goals of instruction.

Evaluation nearly always means one of these things to specific groups of consumers of evaluation; and none of the other things. Therein lies the crux of evaluation methodology as a problem of critical inquiry -- for the meaning of program evaluation can be shown to be linked to the presuppositions of a culture of decision makers, who are either unaware of other meanings, or who comprise an unconvinced audience that discounts the value of other approaches.

How can there be so many espoused views? House (1988) and Smith (1988) recently revisited the problematical nature of the fact-value distinction in institutional research, where almost any decision can be reached from either the perspective of fact or of value. From one point of view, the underlying motive for an evaluation may be to elicit generalizable principles from data sets that enjoy generalizability. Representative samples, objectifiable variables, and replicable study protocols in that perspective serve decision making that would have basis in fact, and accepts the premise that factual data is both important and available. A converse motive may be to construct a set of coherent statements about the nature of a problem. From this perspective, the cohesiveness of the data requires consensus among stakeholders that the "proper" information has been collected from "credible sources" and has been organized in a way that is "meaningful." The latter premise is rooted in the belief that subjective elements in evaluation are both necessary and valuable.

The following example may help to illustrate the nature of the problem pressed onto evaluators by the fact-value distinction. A recently funded project for gerontology education proposed to "close the health care gap" for nurses of the elderly in a particular mid-Atlantic region. This statement came at the very end of a long proposal full of performance objectives for the administration of the project. The meaning of the statement however is not immediately obvious. Closer analysis of the text of the proposal suggested the goal would be realized in three ways: By improving the professional expertise of nurses of the elderly; by increasing the accessibility of services to the elderly in the region; by increasing the level of assimilation of services to the elderly by a majority of institutions in the region.

Instead of clarifying the fact-value distinction, these three categories of activity raise even more questions. For example, professionalization may refer either to (1) measurable differences in learning among nurses who attended continuing education classes or (2) the quality of the educational program. Accessibility may refer either to (l) how much the program costs or (2) the real costs of failing to provide such a program. Finally, assimilation of services may refer to (1) how to increase participation of hospitals and clinics in the region or (2) how the community will benefit from additional services. None of these were issues raised overtly, nor were they part of the ostensive reference of the proposal. This author as evaluator had to quite literally build a conceptual model of the content of the proposal before strategies for data collection could be discussed.

Problems of method and paradigm

Method. Why was the hermeneutic method selected? The preceding discussion was in fact an example of the types of conscious questioning that are employed in the hermeneutic approach. As a formal method of textual analysis in program evaluation initially proposed by Dilthey, hermeneutics serves a method of interpretation. It is a form of content analysis which can follow one of two approaches: (1) the inferential approach in which categories are derived from text and the investigator works directly with given text; or (2) the interpretative approach in which text is restructured to arrive at less obvious, nonostensive levels of meaning. The hermeneutic method in a more familiar mode occurs during psychoanalysis. Analyst and analysand work from clues toward consensual and emergent conclusions. Superficial events are found to be psychologically meaningful as both participants evaluate material and re-evaluate meanings.

The basic principles applied in hermeneutics are as follows:

1. Methodological problems are presented by text.

2. Text offers up clues.

3. Clues can move by a process of construction toward a synthesis of "meaning" taken from "actual material."

4. A hermeneutic circle of meaning is preserved as the investigator is free to propose more than one level of meaning by continual referral to the source material of the textual information.

The last principle is actually controversial. Ricoeur (1974) saw the task of inferring meaning as a problem of opening up text, moving it beyond the domain of text as it is given. Ricoeur also views hermeneutic analysis as a way to liberate text from inferences about the author's intentions while including all connotations in order to provide a manifold account of text meanings. Gadamer (1960) conversely sought to expand the meaning of text by contrasting "horizons of understanding," thereby increasing the horizon of the investigator, by factoring additional sources of textual information into prior categories constructed from problematical texts. All approaches to this method, however, are in agreement that the researcher must build a model of a problem that is based on a theory of textual meaning, in attempt to reconstruct the underlying meaning of the textual material.

Paradigm. The rules of pragmatic analysis are interpretative. Instead of focusing on logical categories of meaning based in syntactic or semantic structures that are invariant or constant over contexts of usage, pragamatic analysis seeks out the structures that are given meaning in communicative episodes. These arise in a context which frames the grammatical and semantic moves that are possible for language users of a particular group. Therefore the structure of the context, or rules arising from that context, are paramount to subsequent study. These rules are interdependent and give to speakers a paradigm for communicating with one another. The paradigm determines those topics and forms that are allowable in a given context, and the paradigm makes it possible for language users to be intelligible to their language partners.

See next page which provides a linguistic example of establishing contextual rules for communicated meaning.

The Connection with Language: An Example of the Pragmatic Structure of Context Rules When Communicating Ritual Insults

More than words and utterances may be at stake in establishing the basis for a pragmatic analysis of communication episodes. The surrounding milieu of the discourse may itself have a structure which governs what can be said by a group of speakers, and how their utterances will ultimately be structured. Familiar examples of how this works have been cited by William Labov in his many examples of playing the dozens. Black teenagers may say things like, Your mother be ugly, she have a beard, she be so ugly her beard touch the ground.

Is this an insult or a joke or just plain bad English? The utterance may be all of the above, and more. It is a game played by experts, a ritualization of one-ups-manship; where each player tops the previous insult with a more incisive insult. You can only lose if you become insulted. You can only win if you sustain the grammatical form of the insult and play within the framework of social rules. Insiders know these rules implicitly, but cannot always make them clear. They develop a sense of gamesmanship by playing the game--which teaches grammatical, poetic and social criteria for staying in the game. Playing well leads to prestige, to a position of leadership and control. One cannot know if the players really are aware of the conditions of language for this game, and outsiders rarely understand what is happening.

Likewise decision making within organizations has expert and novice players. They are distinguishable from one another depending on how well they understand the working theories of decision making within their organizations. The theory contains descriptive assumptions about normative behavior; explanations of how change occurs and how to account for change; and statements about the importance and desirability of predicting and controlling change. There is frequently a language that accompanies a particular theory of decision making. The language contains implicit rules for how to describe patterns of cause and effect, and how to account for cause and effect, including finely tuned expressions that convey the importance assigned to questions of accountability, the measurability of outcomes, or objective measures. From a pragmatic perspective one realizes that both language and its working assumptions emerge from dialog and interaction within an organization. Its meanings are not givens, may not have standard applications across all levels of an organization, and may not be shared by all participants. After all, there may be countercultures; even teachers' unions may be part of the dialog.

Whenever decision makers seem unclear about choosing an approach for an investigation, they may also be unclear about the paradigm underlying decision making in either a general sense, or in reference to a particular problem. This particular use of paradigm refers to a closely related set of assumptions that guide choices of evaluation methodology and desired data types.

Most requests for evaluation services focus on assistance in selecting tests or designing surveys, without any clear sense at all that the possible range of choices in problem solving methods is bounded by the type of paradigm that describes the problem to be solved. According to Smith, there are at least two paradigmatic cultures that can be applied in program evaluation: one, influenced by the natural sciences and the other, influenced by a philosophy of intentionality. Smith has distinguished these paradigms accordingly. The first sets about building a system of abstractions that represent features of the problem to be solved and point toward strategies for control of the problem. The second is based in phenomenology and is concerned with uncovering the dialectical processes by which the meaning of a problem is constructed by participants engaged in problem solving. Convergence upon control is the more immediate goal of the first approach; whereas, the search for congruence among divergent values and points of view is the more pressing problem for the second.

Another way to contrast approaches toward evaluation is to recast the fact-value distinction as a division between solutions to problems that are grounded in features of measurability versus those that are grounded in responsiveness to participant opinion. The chart below is a preliminary attempt to organize under the two paradigmatic approaches the distinctive themes of each and the distictive linguistic features that are most commonly associated with each paradigm.

Paradigmatic Approaches to Evaluation Activity

MEASURABILITY FOCUS	RESPONSIVE FOCUS
Themes	Themes
The search for criteria for judgment are generally ignored.	Clarifies goals, alternatives. Is concerned with judgments of worth.
Assesses distances between goals and current status.	High degree of concern about "insiders" and "outsiders."
Makes no distinctions between competence and performance.	Speaks of constituencies. Speaks of priorities.

	Concentrates on portrayal.
Argues change can be linked to pertinent variables located within problems. Argues change can be manipulated.	Studies antecedents, transitions and transactions.
Seeks standardization of methods for implementing change and for measuring. Seeks standardization of change.	Focuses on synthesis of solutions from divergent data sources that are considered to make unique contributions and to have individual merit.
Linguistic features	Linguistic features
Key words can include:	Key words can include:
accountability, objective, standard measures statistically reliable measures objective outcomes measurable outcomes measurable attributes products and product delivery metaphoric language sic: inputs, outputs improvement "hard data" tests	conceptualization purposes and concerns of participants open evaluation processes credibility of judges synthesis judgments of worth stakeholders and constituents consensus

Likewise, a paradigm for evaluation works like a game plan. One asks, What is the general goal of problem solving in this context? and, What are the allowable procedural moves in the form of data analysis? Evaluators must often think strategically, and thinking this way about the evaluation can lead to definite distinctions in the pattern of communication employed to clarify the nature of the evaluation problem and to describe the way to solve the problem.

Implication and conclusions

In applied anthropology, practitioners will frequently assert that an organization has a theory about itself. Anthropologists search for this theory by eliciting a body of precepts that seem to describe a sense of a culture in an organization. They arrive at a definition of the culture by examining documents, internal memoranda, policies, statements of procedure; or by interviewing significant members of formal and informal networks within an organization. They may interpret myths about heroes within organizations; or they may analyze rumors. In every endeavor however, the sense of a culture that emerges is an idiosyncratic one, one that was achieved by interpretation, that comes largely from subjective points of view, that depended on understanding values and norms. From this culture of decision-making, a characteristic lexicon of linguistic expressions can be expected to surface. These expressions, after sustained study, chiefly serve as a body of language forms used by participants in an organization to describe itself to itself, and to represent itself to others.

Something else helps to create the lexicon of expressions that characterize a culture of decision-making: a dialogic process whereby meaning is negotiated by participants in decision making. One might conclude therefore that the evaluator must also be aware of the strategies by which the contextual rules for meaning are created, and aware that meanings have an ontological reality which may have to be explored.

Rules and strategies then represent the theory an organization has about itself. It is a working theory, and it is helpful in predicting decision making, but only for the culture from which it arises. It is constructed chiefly from language; language that guides the interpretation of behavior within a corporation, university or school house. In this sense, pragmatic study looks as much at language-makers, and the context in which language is made, as it does at the formal and purely linguistic material of speech. Thus it may also be possible for the insiders of a problem-solving setting to be confused about the conditional terms they use to assign meaning through language to what they do. This happens precisely because they are insiders, and their sense of meaning typically remains at a tacit level. It would likewise be the case that outsiders would be confused for they do not understand contextual structures that frame the use of the language they may hear from decision makers. Outsiders would not have been participants in the dialogic process of language-making that takes place over a long period of time-- wherein members of a culture disclose the organization to themselves.

Conclusions. Reasoning about decision-making can be easily impeded by strong contextual influences. To overcome the effects of context, evaluators can guide decision makers to raise questions about their use of language in order to disclose underlying paradigms for making decisions and assumptions about the nature of change. Evaluators can encourage decision-makers to reflect on their own practices and get them to think about how they solve problems from a particular perspective or about the various types of data upon which they depend. Almost always the paradigms will be found to be mixed and the data types not clearly thought through. Thus the evaluator's overall task may be to bring decision-making under conscious productive control, at least during the period when evaluation questions are being formulated and refined. There are some criteria for accomplishing this result, and they are listed below in the form of generic questions that may be posed during the course of evaluation planning.

1. Does the importance of evaluation findings hinge upon the ability to assert that outcomes enjoy conditional or probable truth; or should the findings be credible assertions about the nature of an evaluation problem?
2. Will the course of decision-making lead in the direction of making predictions and generalizations from the discretely designed studies; or will decision-makers need to act upon the unique characteristics of a particular program in a particular setting?
3. Will the evaluation study employ normative data, or will data be selected for its idiographic value?
4. Does the evaluation problem occupy a specifiable domain of information, whose boundaries are knowable in advance and whose contents are discrete?
5. Are evaluation questions population based; or grounded in context and possibly even theory-dependent?
6. Will the eventual decision be about the control of outcomes; or will it disclose the experience of a problem?

The responses to these questions necessarily are grounded in either a need for "facts" for data-based decision-making. Or they will lead both decision-maker and evaluator into more participant based models of assessment. It is this evaluator's opinion that almost no attention is paid to the problem of matching paradigm to the context of decision-making and data collection. Since the word evaluation itself entails the notion of finding value, the task of leading others through a systematic process of weighing the value of data in full view of the problem to be solved can only be a challenging one.

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Teaching Thinking and Measuring Competency: How Accountability Assessment Influences Curriculum and Instruction

Carolyn M. Wood

With the passage of educational accountability legislation mandating the measurement and reporting of student achievement in nearly all states, the use and importance of educational testing in general, and achievement tests in particular has increased markedly over the past 15 years. At the present time, according to a recent report from the National Governors' Association (1988), 48 of the 50 states have established state testing programs or provide for local testing. Over the past three years alone, 27 states have adopted new testing programs for purposes of monitoring the progress of reform initiatives and certifying student competency, this in addition to locally-instituted assessment programs (National Governors' Association, 1988).

According to a survey conducted by Friends for Education (cited in Cannell, 1988), some 32 states administer nationally normed standardized achievement tests statewide, and local districts in the other states administer tests which they select. Of those, 26 employ commercially developed instruments and six give state-prepared tests. Commercially-developed norm-referenced instruments, like the *Comprehensive Test of Basic Skills* (CTB/McGraw-Hill, 1981), the *Stanford Achievement Tes* (Psychological Corporation/HBJ, 1982), and the *California Achievement Test* (CTB/McGraw-Hill, 1977), which have been identified as the most widely used state assessment instruments (Cannell, 1988), provide information ranking students with respect to their peers around the nation regarding their knowledge of the skills and content which comprise reading, language, mathematics, social studies, and science. These instruments are used as indicators of the number or percentage of pupils performing "on grade level" in particular subjects.

Many states have also developed criterion-referenced or competency tests which are designed specifically to assess directly what is supposed to be taught in the curriculum. Unlike the norm-referenced instruments described above, which are designed to rank order students in terms of their competence, these tests, which are based upon specific instructional objectives, provide indicators of the percent of pupils who have "mastered" certain prescribed skills or content and have thereby demonstrated "competence."

Widespread reporting of student performance on tests state by state, district by district, school by school, and grade by grade, has added a significant political dimension to public education and is sustaining a national debate about the quality of education provided by the public schools.

Concerns about school accountability and the need for documentation of student competence led to widespread use of tests in local and statewide accountability assessment programs beginning in the 1970's. As George Madaus pointed out (1985), widespread use of standardized tests as tools in the implementation of policy began in the late 1960's, when performance contracting and other experimental programs were tried out in response to local calls for school reform and substantial funding increases in compensatory education programs carried with them requirements for evaluation. Then in the early 1970's, concerns about low test scores and large numbers of students graduating from high school unable to read, write, and compute led to the imposition of competency requirements as high school graduation prerequisites and requirements for grade-to-grade promotion in many states.

The acceleration of educational reform in the 1980's beginning with the establishment of a National Commission on Excellence in Education in 1981 and the influential report produced by this group two years later, *A Nation At Risk*, brought with it further demands for the use of tests as indicators that the quality of schooling was indeed improving. Currently, in addition to the widespread administration of nationally-normed standardized tests on a statewide basis, the projected extension of the National Assessment of Educational Progress (NAEP) is expected to provide for statewide assessment and state-by-state comparisons of pupil achievement in mathematics, reading, science, and other subject areas after 1990 (National Governors Association, 1988).

In Maryland, the statewide accountability assessment program includes two components. A norm-referenced instrument, the California Achievement Test (CAT), is administered annually to all third, fifth, and eighth grade students statewide, providing information ranking the achievement of students and average school achievement in relationship to a national reference group in reading comprehension, language, and mathematics. A second component, the competency testing program, includes a series of instruments developed according to specifications dictated by the state's Declared Competency Index (Maryland State Department of Education,1977) and measuring skills in reading, mathematics, citizenship, and writing. Students are given repeated opportunities to take and pass each of these competency tests, beginning in the ninth grade. Passing all four competency tests has been established by the state board of education as prerequisite to the high school diploma for all students.

Through actions of the state board of education, the implementation of this extensive testing program in Maryland has had profound effects upon curriculum and instruction. Prior to administration of the tests, for example, the state board mandated that a system-wide "curriculum-competency match" involving both the norm-referenced and competency tests be carried out in each of the 24 local school districts in order to insure that the "competencies" measured by the tests were being addressed appropriately in instruction. Moreover, students who do not pass any of the competency tests in the ninth grade must be provided "appropriate instructional assistance," documented by the school principal, until the test is re-administered and they earn a passing score.

The power of the testing program to influence student learning outcomes and the curriculum in Maryland is beyond question. Passing rates on the state's functional mathematics test, for example climbed from 40% in 1982, the first year the test was administered, to 61% a year later and up to 75% last year. Scores on the reading test have improved to the point where 95 percent of ninth graders around the state pass the test on the first administration.

In 1985, Paul L. Williams, then state assessment director, noted "many instructional and organizational alterations" in school districts throughout Maryland in response to the implementation of competency testing, including prominent classroom displays of state objectives, cross-referencing in district curriculum guides of textbook objectives and state competency objectives, individual activity packets for students focused upon state competency requirements, and the like.

The influence exercised by the state testing program upon the conduct of public education in Maryland is by no means unique. In a 1985 article, W. James Popham, a leading proponent of competency testing, pointed to city-wide testing in Detroit and to state testing programs in Texas and South Carolina, along with Maryland, as exemplary in their implementation of competency tests assessing student proficiency in the "basic skills" of reading, mathematics, and writing which have produced significant changes in curriculum and instruction. In Texas, for example, a list of mandated objectives or "instructional targets" was distributed to all school curriculum specialists and teachers. Competency test scores, aggregated at the school and district level and reported to the public, improved by an average of 10 percent during each of the first three years the tests were administered (Cruse, 1985). In Detroit, the proportion of twelfth graders passing all three parts of the city's proficiency test improved from under 70 percent in 1980 to 74 percent in 1982 (Rankin, 1985). In South Carolina, the percent of third grade students meeting state standards in mathematics jumped from 61 to 79 in three years (Sandifer, 1985).

Popham's conclusion that "measurement-driven instruction works" (1985), however, bears more careful analysis. It does appear to "work" when success is defined as attainment of the generally-minimum competency objectives prescribed. Students are indeed demonstrating through test performance that they are "mastering" the "basics" at higher rates than ever before. The proportion of students passing competency tests by the end of the twelfth grade in Maryland, for example, is approaching 100 percent. High stakes testing of the sort mandated for Maryland students obviously "works," according to the most obvious criteria--students are passing competency tests and meeting state graduation requirements and there has been no significant increases in the number of students "dropping out" of high school before graduation.

While norm-referenced achievement tests are less "high stakes" for students--as well as teachers and administrators--their impact upon instruction has been no less significant. The power of school-by-school publication of average percentile and grade equivalent scores to shape what is taught to whom and when is apparent in the current controversy raging about the validity of published norms for standardized achievement tests. Analysis of improvements in norm-referenced test scores prompted a West Virginia physician, Dr. John Cannell, to establish an organization for the purpose of publicizing what has been referred to as the "Lake Wobegone effect" in standardized testing (Phillips and Finn, 1988). Newly-standardized tests are bearing witness to an on-going trend towards higher scores on tests of "basic skills" in reading, language, and mathematics (see, for example, Drahozal and Frisbie, 1988).

In Maryland, for example, between 1981, the first year for the statewide administration of the California Achievement Test Form C, and 1985, average grade equivalency scores for third, fifth, and eighth graders have increased in each area reported. Reading comprehension, language, and mathematics scores improved by two-tenths grade equivalent units for third graders, by four-tenths for fifth graders in language and mathematics, and by one-half year for eighth graders in reading and mathematics (Maryland State Department of Education, 1986).

This is indeed strong empirical evidence, then, that measurement-driven instruction "works": students are scoring better on the tests by which they--and their teachers and their schools and their school districts--are being evaluated. Whether or not it "works" in light of a broad range of important cognitive outcomes, including many commonly-defined "thinking skills," however, has not been established.

One major concern driving the current educational reform movement has been students' perceived inability to think critically and proficiently, to understand and formulate problems, to generate and test hypotheses, to evaluate the reasonableness of solutions, and so on. The authors of *A Nation at Risk* (1983), for example, observed that many 17-year olds do not possess the "expected" intellectual skills of inference-making, construction of a persuasive essay, and mathematical problem-solving, inadequacies they saw as explainable at least in part by changes in the high school curriculum, which they labeled "homogenized, diluted, and diffused," with opportunities for student choice resulting in students enrolling in much smaller numbers in more rigorous academic courses.

Similarly, Lauren Resnick (1985) noted that in general students do not attempt to "make meaning" from the mathematics they are taught and concluded that mathematics courses of study do not seem to foster what she calls "mathematizing," that is, constructing links between mathematical expressions and real situations. This point was made similarly by Silver, who commented on students' inability to solve an estimation problem on the National Association of Educational Progress (NAEP). He observed with interest that fewer than half the students who were able to compute the answer to an arithmetic problem when told to do so were able to recognize the correct answer when asked to estimate the solution to a similar problem.

In light of widely-expressed concerns that students are unable to process information effectively and efficiently, to recognize and appreciate the "open-endedness" of much of human experience, to evaluate and reflect upon their own thinking, and the desire to improve the rigor and quality of education by focusing upon producing better thinkers and learners, it seems ironic and unfortunate that the means selected by so many educational leaders throughout the nation to enforce "quality" has been norm-referenced achievement and minimum competency tests.

Careful examination of widely-used norm-referenced achievement tests suggests they can tell us little about students' abilities to see relationships, to draw inferences and make predictions, to evaluate information and lines of arguement, to analyze and synthesize, to make reasoned judgements, and to recognize and use appropriate cognitive strategies. They tell us even less about those attitudes and dispositions which characterize critical thinkers. In fact, virtually none of the recognized attributes of critical thinking--complexity, subjectivity, appreciating multiple perspectives and solutions--or of the critical thinker--meaning-maker, initiator, evaluator, skeptic, planner, self-regulator, persistent inquirer--is addressed by items which appear on standardized achievement tests.

The reasons for this are not far to seek. Test publishers--and users--need paper-and-pencil instruments which cover a broad spectrum of academic disciplines, can be administered and scored easily, with minimal training and direction to teachers, quickly, and at low cost, and provide easily-interpreted norm-referenced (and sometimes criterion-referenced) performance data. Publishers of the *California Achievement Test* (CAT), for example, attest that the instrument is designed "to measure achievement in the basics of any instructional program" (see *Test Coordinator's Handbook*, p.7).

CAT items were selected to represent so-called "objectives," the basic skills identified as most common to curriculum guides and other instructional materials reviewed prior to test construction. These "objectives" are not truly instructional goals but rather general descriptions of the content of test items: for example, in mathematics, the "objectives" refer to topics such as number sentences, geometry, measurement, and story problems. Whatever processes or operations students use in addressing the items--recall, analysis, evaluation, drawing inferences, etc., for example--are not addressed in the "objective" or in the scoring.

Analysis of the shortcomings of current tests in assessing student thinking, however, should begin with a closer look at what "thinking" is--at least as many educators have come to understand it. Over the past 30 years or so, numerous alternative models of thinking have been proposed as guides in the development of curriculum and instruction. Two of these are of particular significance to educators, the first, Benjamin Bloom's taxonomy (Bloom, 1956), because it represents a pioneering effort to provide a comprehensive listing of cognitive skills relevant to instruction and because its "language" has become part of nearly every teacher's vocabulary, and second, the recently-published *Dimensions of Thinking* because of its unique multiple authorship (a group of seven educators and psychologists supported by a host of distinguished reviewers representing a wide variety of public schools and school systems, colleges and universities, research institutions, government agencies and the like), its endorsement by a major professional organization (Association for Supervision and Curriculum Development), and the comprehensiveness of the model proposed.

Bloom's work offers six categories of cognitive operations: knowledge, which deals with the recall and recognition of facts, concepts, definitions, rules, principles, and procedures; comprehension, or the translation, interpretation, and extrapolation of these kinds of information; application, the use of what is known or comprehended to solve problems; analysis, the breaking of a whole into its components; synthesis, the formation of a new cognitive product through hypothesizing, inferencing, predicting, generalizing, imagining, creating, etc.; and evaluation, the assessment of the value or worth of an idea, product, etc., according to stated criteria.

A framework representing a different and in some ways more comprehensive and cognitively-sophisticated approach to thinking has recently been proposed by the Association for Supervision and Curriculum Development as a guide for curriculum and staff development programs. This framework, comprised of five so-called "dimensions" of thinking, is not a taxonomy, as the authors explain, because the categories are not mutually exclusive and not hierarchical. Rather its intent is to emphasize the dynamics of thinking, the complexity and inter-relatedness of thinking processes and strategies, the co-mingling of cognition and affect within the thinking process, the importance of metacognition, as characterized by Flavell (1976) as encompassing both self-knowledge and monitoring/control of cognition, the complementary relationship between critical and creative thinking, and the changing ends/means roles of thinking skills and processes.

A closer look at the components of *Dimensions* suggests specific cognitive behaviors which are legitimate instructional outcomes. *Metacognition* encompasses knowledge and control of one's attitudes and beliefs, including understanding of the influence upon one's work of a sense of commitment to the task, appreciation of the importance of effort and willingness to perservere, a sense of self-efficacy, voluntary control over attention, the ability and willingness remain "on task" while learning new content, aquiring and practicing skills, solving problems, and so on.

The second "piece" of metacognition involves the aquisition of the kinds of knowledge one needs in order to control cognitive behaviors and the application of this knowledge to the completion of a task. Adopting the model of Paris, Lipson, and Wixson (1983) for completion of a learning task, *Dimensions* points to the importance of declarative, procedural, and conditional knowledge as essential to task control and to the three separate elements of the executive control of behavior--planning, regulation, and evaluation.

Critical and creative thinking represent the second dimension in this model. The *Dimensions* model accepts as highly relevant to schooling Robert Ennis's view of critical thinking as embodying both skills--analyzing arguments, seeking clarification, judging the credibility of sources, making value judgements--and attitudes or dispositions--seeking reasons, valuing information, seeking alternatives, retaining an "open mind," and the like (Ennis, 1985). Creative thinking is identified as involving hard work to the point of being "unreasonable" (Perkins, 1985), acceptance of risk, driven by a powerful internal locus of control (Perkins, 1985), and, perhaps most important, is characterized by the reframing of ideas. In this model, however, creative and critical thinking are not set up as oppositional but rather as complementary to one another

The third dimension of thinking identifies sequences or sets of operations called cognitive processes. These include concept formation, principle formation, comprehension, problem-solving, decision making, research, composition, and oral discourse. While they overlap in operation, these processes are, according to the authors, "conceptually clear" and highly teachable. Four of the seven--concept formation, principle formation, comprehension, and oral discourse--are ways of gaining knowledge. The formation of concepts, which Klausmeier defines as a "mental construct commonly symbolized by a word in a society" (1985), is the process by which an individual learns how society defines important abstract as well as concrete entities. Principle formation represents the individual's recognition of relationships between concepts, which may include cause-and effect, correlation, probability, and axioms (Klausmeier, 1985).

Comprehension is seen as the process by which individuals generate meaning from experience--written text, oral discourse, visual images, etc. According to *Dimensions*, comprehension of written text is best viewed as a three-part sequence of behaviors occurring before, during, and after reading, with particular cognitive behaviors appropriate to each stage specified. These include, for example, categorization of information, summarization, confirmation/disconfirmation of predictions, evaluation of adequacy of information for particular purpose, extension of learning, application, and transfer of learning--all identified as appropriate "after" or "outcome" behaviors.

Four other processes--problem-solving, decision-making, research, and oral discourse--are identified as facilitating the production or application, as opposed to the acquisition, of knowledge. Problem-solving, according to the *Dimensions* model, applies to situations where goals require some sequence of steps and refers to both typically clear-cut "academic" and typically "fuzzy" "real world" situations. Decision-making is related to problem-solving but is characterized by a search for the "best" alternative. Steps in the decision-making process vary with the particular model followed, but provision is usually made for the identification and clarification of the problem, identification of the goal options and criteria, comparison of options in terms of the criteria, selection of the most appropriate option, and verification of the selection.

Research is defined as scientific inquiry, the end product of which is understanding and prediction of some phenomenon. It is characterized by a thorough description of the phenomenon as a result of observation, classification, comparison, etc., the formulation of hypotheses, the testing of these hypotheses, and the statement of conclusions.

The process of composition is defined in the model as the conception and development of a product--written, musical, or artistic. The emphasis in *Dimensions*, which after all is teaching- rather than testing-focused, is upon characteristics of the process of composition, conceived as a recursive cycle of planning, translating or drafting, and reviewing what is produced. There is a strong metacognitive flavor to the composition process; it is seen as controlled by some "monitor" or "executive processor" at work internally within the composer. The function of instruction then is to increase the strategic repertoire of the composer as a means of improving his/her control over the components of the composition cycle.

Oral discourse or dialogue is identified by the *Dimensions* model as a vehicle for acquiring or applying knowledge, a medium that is social and inventive, a means of imposing order and making meaning. Viewed as educational outcomes and as process, dialogue and instruction in oral discourse, according to this model, serve a number of important purposes: organizing and shaping knowledge, stimulating self awareness, appreciation of the role of language in persuading or regulating one's own behavior and the behavior of others, and the acquisition of social and ethical values.

The *Dimensions* model also identifies so-called "core-thinking skills," which are defined as specific cognitive operations which contribute to the broader processes. These include focusing skills, which allow individuals to attend to selected pieces of information in order to respond to a problem; information-gathering skills, which bring to a conscious level whatever is to be processed through observation and the formulation of questions; and remembering skills, which represent strategies used to store information in--and retrieve it from--long-term memory. Organizing skills, including comparing, classifying, ordering/sequencing, and representing, are operations used by the individual to structure or arrange information to be processed. Analyzing skills, help the individual to examine and focus upon information and include the identification of attributes and components, relationships and patterns, main ideas, and errors. Generating skills involve the constructing of new organizations of ideas through the connection of new and old information. This construction is effected by inferring, or going beyond available information; by predicting, or anticipating future outcomes; and by elaborating, or adding details, examples, or other prior information. Integrating skills involve putting together pieces of information by summarizing and restructuring. Evaluating skills involve assessing the reasonableness and quality of experience through the establishment of criteria and verifying or establishing the truth of some idea according to standards.

Examination of these models of thinking gives rise to questions regarding whether current statewide assessment tools are adequately addressing the cognitive skills identified as important. To explore this issue, it is useful to survey the language of the test items and the cognitive behaviors required of students taking Maryland's norm-referenced and competency tests.

While there is no over-arching definition of the construct "reading comprehension" as addressed on the *California Achievement Test*, this section, according to the publisher, taps literal, interpretive, and critical comprehension. "Literal" is defined as "recall of facts;" "interpretive" includes the categories of inferred meaning, character analysis, and figurative language; and critical comprehension items are those which focus upon "author attitude and position" and "techniques of persuasion."

Looking at Level 18, the level of the CAT administered to eighth graders, it is illustrative to examine the balance of items by type. Seven address literal comprehension, 21 are classified as "interpretive," and 12 are labeled "critical comprehension." The test is structured around nine separate passages, including a brief (five-paragraph) biographical sketch, a one-paragraph radio commercial, a sales presentation (two paragraphs), a 20 line poem, a four-paragraph history of the development of a musical instrument, three one-paragraph letters-to-the-editor, and a four-paragraph description of a volcanic eruption.

The general directions to students tell them to read each passage and complete the items which follow it, selecting the best answer for each item. The test items are structured either as questions, prefaced by "which," "what," "how," "why," etc., or as sentence-completion tasks. The questions/item stems are all short (less than 15 words), unconnected, and all have one clearly correct answer. The student is not required to do any sustained reasoning, to engage in dialogue with the text, to summarize arguments, identify and support the main idea, or to defend a particular interpretation of a passage, character, etc.

The literal comprehension items typically include a key word which, once located in the text, will lead the student almost inevitably to the correct answer. Interpretive comprehension items include "inferred meaning" items which require the student to select the best statement of the main idea of a passage, understand a key vocabulary word, etc. "Character analysis" items ask the student to select the best single-word description of a character or to select the phrase which best describes the character's motivation (closely tied to a sentence in the text).

Figurative language is assessed exclusively by seven items following a 20-line poem, the title of which rather clearly implies the metaphor which is developed. These items are focused upon the translation of specific words and phrases of the metaphor. Five of the seven specifically ask students to select the best representation of the literal meaning of a single word or phrase in the poem; one item asks the student to select the best translation of a five-line image; and one asks the student to select from alternatives the metaphor used in the poem to express a concept.

Critical comprehension is measured by three short passages simulating a radio commercial and three a sales text. Of the six items, two ask for the author's purpose in using a particular phrase, one asks the student to select the best statement of the overall purpose of the commercial, two others address specific propaganda techniques, and one asks for the interpretation of a specific vocabulary word.

Even this brief look at this approach to assessing reading comprehension strongly suggests the inadequacy of the test as an instrument either for diagnosing students' reading problems or for measuring achievement. Nor does the measure of reading competency offered by the *Maryland Functional Reading Test* provide an adequate view of students' reading skills. This test includes items developed to measure skills in five so-called domains of functional reading: locating information, understanding forms, gaining information from details, understanding the main idea, and following directions. These "domains" are clearly less representative of discrete cognitive processes, however, than they are of item types--students' cognitive behaviors in responding to these various items are nowhere identified in the description of the test. There is no indication that the test is based upon any theory of how comprehension is acquired. There is no consideration of differences in the processing demands associated with these different types of items. If the teaching of reading were to follow the sequence defined in *Dimensions* (1985), which is marked by a strong metacognitive sense, the so-called "diagnostic information" provided by the MFRT is of little or no use to teachers. The teacher could in fact conclude only that, if the student is having difficulty recognizing where information is located on various forms, simply provide him with more practice using forms. The usefulness of such practice either in making the student more accurate in completing forms (since forms are very different from one another and the identification of common elements is left to the teacher) or in helping the student become a "better" reader is questionable, however.

Examination of the mathematics and language sections of the CAT and the state competency tests in mathematics and citizenship skills suggests very similar limitations. The test items tend to focus upon the recall of information, are characterized by an unambiguously correct response, use focused upon narrowly-defined situations, and do not allow for students to process information in any complex ways. As Lauren Resnick (1987) has observed, "Current testing practices in American education do not provide very powerful tools for assessing the effects of efforts to teach thinking and reasoning. . .(and) may in fact interfere with cultivation of the kind of higher order skills that are desired."

As we look to the future, however, there seems reason for optimism that testing practices will be modified to support the teaching and learning of higher-order thinking. For one thing, there is increasingly serious discussion of the limitations of standardized testing as measures of learning. In *Beyond Standardized Testing* (1988), published by the National Association of Secondary School Principals, Archbold and Newman point to the need for "informative assessment of authentic achievement" and call for assessment tasks which reflect disciplined inquiry, knowledge integration, and which have value beyond evaluation. To accomplish this, they are recommending alternatives to selected-response-format measures like standardized achievement tests including direct measures of performance--the production of a piece of writing, assessment of the spoken and listening language competency of students, essay examinations in the content areas, problem-solving tasks, portfolios and projects, and the like.

In their 1988 report the National Governors' Association, a group which has recently become outspoken in its views about the mission and conduct of public education, asserted the need for students to acquire "intellectual flexibility," learning new skills, comprehending and communicating complex ideas, responding to novel situations, finding as well as solving problems, and evaluating what they see and hear. Although current testing by and large does not allow for the measurement of these skills, two states--Michigan and Illinois--are revising their current assessment instruments to reflect current research about the teaching and learning of reading skills, and the state of California is reviewing and revising curriculum frameworks and assessment instruments to address problem-solving, science, and critical thinking in the social studies. The Michigan reading assessment, for example developed in the early 1970s, has been revised to reflect current thinking about reading comprehension, i.e., that it is a process whereby meaning is constructed by the reader through dynamic interaction with the text. This view is in contrast to the early notion that reading was properly taught as a hierarchy of skills. In an effort to reflect this definition in the state assessment instrument, test developers approached assessment holistically, formulating items which address the student's knowledge about the topic of the passage, his/her ability to interpret--or "construct meaning" from--what is read, the student's knowledge about reading strategies, and their attitudes about themselves and the test (Wixson et al, 1987).

Alternatives to multiple-choice format tests also are being tried out in schools, school districts, as well as at the state level. For example, the state of Connecticut has employed performance assessment in art, music, business and office education, English/language arts, industrial arts, foreign language, and science (Baron, 1988). While there is optimism that the development of a "patchwork quilt" of assessment formats will encourage school districts throughout the state to employ performance testing along with other techniques to monitor students' acquisition of state-identified skills and competencies (Baron, 1988), the obvious cost and technical problems in restructuring large-scale assessment instruments, commercially produced referenced achievement tests or state competency examinations to include formats such as essays and performance tests suggest that these changes may not be made any time soon.

Not only must problems associated with reliable and cost-effective administration and scoring of student productions and performance be resolved but also issues regarding the validity of different approaches to the assessment of thinking must be addressed (for example, should thinking be tested exclusively within subject matter domains or should thinking skills be assessed independent of traditional subject matter areas) and, if "thinking" is to be defined in terms of "competency" (as reading and mathematics have been defined), what kinds of thinking should be expected and what levels of proficiency should students be required to demonstrate?

The proper emphasis upon process as a legitimate focus of assessment must also be considered. Snow and Lohman (1988) identify increasing sophistication in the assessment of cognitive processes as an example of the kinds of contributions modern cognitive psychology is likely to make to educational testing in the near future. As they point out, the cognitive revolution that has occurred in psychology over the past thirty or so years has focused psychological inquiry upon the processes involved in attention, perception, memory, problem-solving, reasoning, and knowledge acquisition and potentially can offer an alternative to the psychometric model upon which educational measurement has largely been based. This model--which informs most existing tests--focuses upon accurately "placing" an individual on some scale representative of a trait or ability. Accuracy of placement is of greater concern than a comprehensive psychological view of the complex of processes and knowledge which determines test performance. The change in focus to what is happening cognitively in the individual and away from measurement precision seems a step along the way to educational tests with more ecological validity and which offer more useful information to the teacher seeking to understand student learning performance.

Public debate about how "thinking" should be addressed in large scale assessment has been stimulated by Diane Ravitch and Chester E. Finn, Jr., in

What Do Our 17-Year-Olds Know (1987). In this report of results of the NAEP assessments in literature and history, Ravitch and Finn argue the need to assess *knowledge*--the who, what, where, and when--rather than *process* on the grounds that *knowing* facts is prerequisite to *operating* on them. Decrying the tendency in the education profession to believe that what children learn is unimportant compared to how they learn," Ravitch and Finn suggest that "cultural literacy" requires that all members of society share an informational background. While they "hope" that test developers in the future will develop alternatives to multiple-choice questions, they suggest that the task of finding out what meaning students have drawn from their reading and experiences is best left to classroom teachers and to improved testing techniques later on. While the knowledge-skill dichotomy is a false one--obviously one cannot operate upon knowledge he doesn't posess--the message sent to educators by these tests seems clear: what counts is the number of facts one has memorized, not the interpretation, the higher-order processing, so to speak, of the facts.

What, then, of the role of the classroom teacher in teaching--and testing--thinking? Many elementary and secondary school teachers are aware of students' deficits as thinkers and are anxious to identify and teach good thinking skills, strategies, and attitudes. The curriculum requirements imposed by current testing programs, however, direct teachers' attention to certain skills and content and often limit their opportunities to explore "thinking" as a content area with their students. While many of these teachers are seriously attempting to improve their students' thinking through instructional techniques such as improved questioning, metacognitive training, and so on, test-based curriculum requirements often interfere with their efforts. Providing training to teachers in instructional strategies, thinking skills, and good test development practices (see, for example, Stiggins *et al*, 1986) will encourage and assist them in improving the "thinking climate" of their classes and their own teaching of thinking skills. It is important, however, to remember that for a number of reasons large-scale assessment is exerting more and more influence over the curriculum. Since clearly what gets tested gets taught--and what doesn't get tested may not get taught, it is important for us to understand the structure, operation and uses of standardized achievement and competency tests and their limitations and their potential for supporting efforts to help students become more competent thinkers.

It is also vital, however, that assistance be provided in the use of existing assessment instruments to support thinking skills classroom instruction. It is also important for the educational community to strive to focus public attention upon the need to improve student thinking in ways that will influence the development of large-scale assessment instruments. If our students are truly to acquire the significant, complex cognitive skills outlined in *Dimensions* for the twenty-first century, then the assessment tools which drive the curriculum in the twentieth century must surely point the way by encouraging teachers and administrators to examine their goals for students in light of their own teaching practices and the cognitive behaviors that are required for students to reach these goals.

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Mariamma Iconography

Judith Johnston

Hindu Images in the New World: Contexts of Recognition

Two recent and oft-cited books by influential scholars of academic process have focused attention on the issue of cultural knowledge in the curriculum. These scholars and like-minded colleagues, an informal Cultural Canon Cadre, have criticized the American educational system for its relativism, its preference for critical thinking over culturally specific knowledge, and for its failure to focus on a specific canon of vetted texts and topics.

I think the conceptualization of critical thinking developed by our conference hosts, the Montclair Institute, is very important in rejection of the ethnocentrism and elitism inherent in the Cultural Canon Cadre's critique. Two aspects of critical thinking are crucial to a response to the CCC. These are first, the stress on the ways in which constraints are placed on the organization of research and scholarly domains by particular disciplinary traditions, and second, the stress on context-sensitivity in the critical analysis of cultural material, both popular and scholarly.

I will describe for you some research in the visual images made and actively used by a culture group which has experienced a global diaspora over the last 150 years. Thus we can compare the images these people make and use in a variety of places as well as over some decades. We can also compare the way these people "see" each others' images and the way scholars "see" the images. The process of "organizing" this popular cultural material can also illustrate how disciplinary traditions and contextual boundaries contribute to our cultural assessments, and to the implicit cultural messages we convey in the classroom.

This research is about Hindu iconography, the signs and symbols associated with visual representations of Hindu gods and goddesses. The Mariamma tradition in Hinduism focuses on the worship of female goddesses such as the Great Tradition deities Durga and Kali and local female ***devis*** or ***ammas*** (mothers). In its South Indian pantheon Mariamma has become closely associated with Madrassi (Tamil) identity in the Diaspora.

The iconography of Hindu gods and goddesses may seem to be arcane material for presentation at this conference but I hope you will enjoy the visual image and the intellectual problems they raise. My conference presentation included 64 slides and a far more visual and less wordy illustration of the themes of the paper than can be included in print. Readers interested in a fuller exposition are urged to contact me.

The Hindu images I will show you have been indigenously created by South Indian Tamils living their religion in various areas of the world. These images, or ***murtis***, of Tamil Shaivite figures such as Kalbhairo, Shiva, Hanuman and Mother Kali are figures of great cultural vitality. We will examine some examples of Mariamma murtis from the Caribbean and from India.

The dispersal of South Indian Tamils from India occurred at many points in history but the greatest number joined the Diaspora in the decades after the end of the African slave trade. As indentured contract laborers, Tamil Hindus were relocated in Sri Lanka, Fiji, Natal, East Africa, and the Caribbean (particularly Guadeloupe, Martinique, Trinidad, Guyana and Surinam) throughout the second half of the 19th century. While indenture from India ended in 1917, the Tamil population has continued to expand in the New World.

Most recently Tamils and other East Indians of the Diaspora have moved yet again, this time to escape oppression and political turmoil in Surinam, Guyana, Fiji, and Sri Lanka. They are relocating primarily in Germany, Australia, Canada, Holland and the United States. South Indian Tamils from both India and from the Diaspora are among the East Indian children in our New York/New Jersey student populations.

For Diaspora Tamils the murtis and other symbols of their Madrassi culture are laden with ambivalence. In the Diaspora how are the murtis to be understood? Are they "imported," remnants of tradition, imitative echos of the cultural dynamics of the far-away Motherland? Or are they perhaps examples of syncretism, embarassing hybrids shaped by the unanalysed admixture of cultural styles at hand, evidence of an unseemly loss of cultural purity? Political minority status in all of the overseas relocation areas has led Diaspora East Indians to a defensive use of their cultural symbols, often cloaked in the external guises of the politically dominant culture. Their own debate on the fate of their culture and their symbols is continuous.

India's intellectual elite, scholars, and her anthropologists hold to the view that Indians compelled to live at a distance from the Motherland gradually but inexorably become polluted by the cultural fog of other cultures. In this orthodox view one must be within the ***darshan***, the aura, of India to be East Indian. Thus the Diaspora's children have not been welcomed home. They are not the subjects of papers in the *Journal of Asian Studies*. They are not invited to send musical troupes to India (although India sends troupes to them). When Trinidad's V.S. Naipaul journeyed to the Motherland he was not innocent of expectation.

Thus the visual images and other symbols of Diaspora Tamils are forgotten figures in the academic study of Indian culture and are cited as examples of "syncretism" or "assimilation" in anthropological literature. But

Diaspora religious activitiy is so energetic and vital that neither view satisfies. I have begun to look at the murtis as metaphors of speech; each murti is a statement which makes sense in the ongoing conversation of the people who maintain its cultural setting.

The murtis are symbols, or, in the terminology of the philosopher Charles Peirce (1932), as brought to my attention by Daniel (1984), they are signs of Mariamma culture. In semiotics, the study of signs, three aspects of a sign are required for a description of its meaning. Following Peirce, these are 1) the meaning of the sign as embedded in cultural history, 2) the object (in this case the murti) which is in front of the viewer and may evoke recognition from the viewer, and 3) the response of the viewer to the object in its cultural context. The sign can only be understood in this triad as part of a community of dialogue among habitual "talkers."

The object (a piece of costume, a body posture, a ritual artifact, a murti) if it is a valid representation of a sign, will trigger a special kind of recognition in members of the community of dialogue, people who "discuss" the sign by their habitual actions in the religious complex. Recognition is an inner feeling, a flash of insight, invariably charged with emotion. It validates the object as a representation of the sign or body of cultural meaning that the object stands for.

Here are several examples of recognition. I have chosen them because you are not likely to have seen these objects before. If you are part of the community of dialogue about Mariamma Hinduism they will evoke recognition even on first viewing. If you are just joining this conversation you will see a few new signs.

PLATE 1 This is a drawing by an unknown Indian artist commissioned by Nicolo Manucci, an Italian traveler in India in the second half of the 16th century, published in 1803. Manucci's notes describe the depiction as "carrying the Karatam," an annual ritual to counteract illness. The central figure, a man dressed as a woman balancing the five *kargam* pots on her head, is surrounded by four other figures. For Tamil Hindus the feeling of recognition is instant and diffuse; it is not likely that one can immediately articulate what aspects of the object trigger that recognition. Recognition is described by Daniel (1984) as a process of abduction, rather than induction or deduction.

Here is another sign from the past, **PLATE 2,** from the French engraver P. Sonnerat, published in 1737. In this scene we recognize the characteristic Mariamma activity of group fire-walking.

Plate 1

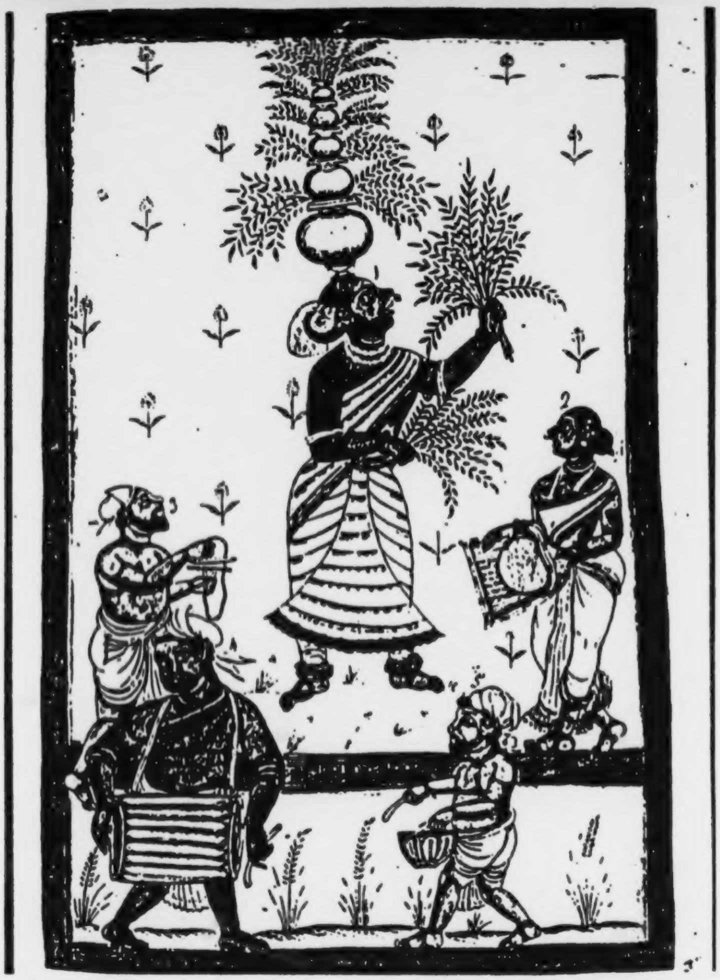
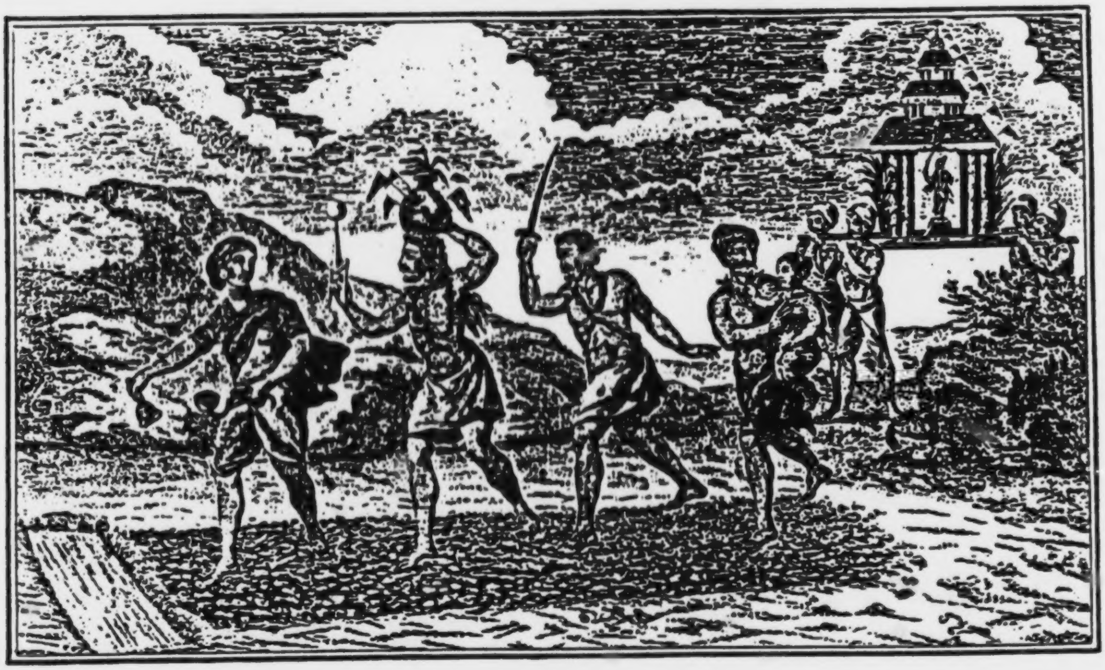


Plate 2



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Now look at imagery of the monkey god Hanuman. The first image **PLATE 3** of a village Hanuman in Guyana is forceful in his solidity, the texture of his skin, the power of his gaze. By contrast here is Hanuman in India; a very familiar and popular bazaar picture, **PLATE 4.** This urbane Hanuman is larger than life, muscularity in the service of society.

These two examples of Hanuman imagery demonstrate striking parallels in formal iconographic characteristics: the orb, the crown, the erect and forward posture, the steadfast visage, the monkey tail. But there is great diversity in the nuances of tone or sensibility that the pieces convey. While Hanuman in India is a superhero ready for his next assignment, Hanuman in Guyana is touchingly less sure, closer to the ground and its scale. India's modern Hanuman displays the gods Ram and Sita emblazened on his heart, while in Guyana Ram's etched name is scattered about his face, torso, garb and limbs.

The way I would like you to look at the images is analogous to methods used in the study of language. Structural linguistics delineates formal properties of language and lends itself to the differentiation of standard and non-standard forms. The "grammar" of these murtis seems to be in place and we recognize them as statements about Hanuman in the language of Hinduism. In contrast to structural linguistics, discourse analysis considers the range of meanings conveyed by "talk" in particular contexts. From that viewpoint each murti is a "comment" or "remark" typical of and intimately appropriate to the discourse style of the murti's cultural context.

The community of devotees consign their members to make the murtis, place them in particular sites and juxtapositions in the religious setting, clean them, dress and feed them, and conduct their shared religious life in the field of the murtis gaze. Each of these gestures and signs contributes to the community's discourse. Hanuman in Guyana seems to be a phatic speaker, one who reveals feelings of shared membership with the community.

Plate 3

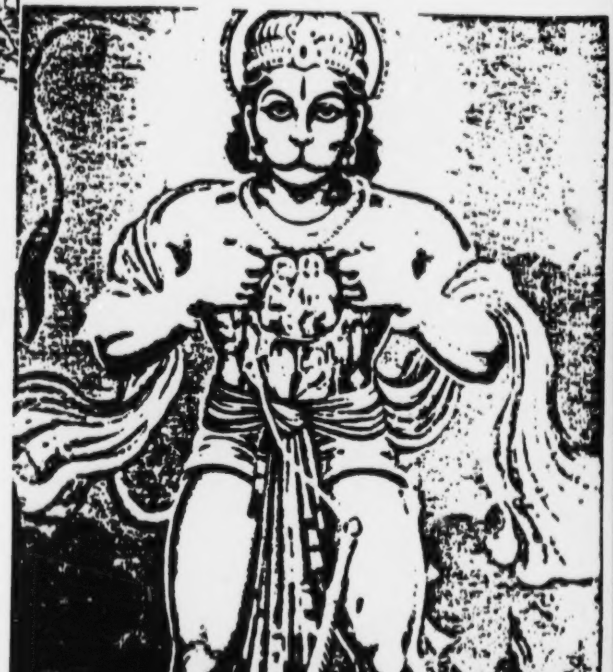


Plate 4

Munis Prem, a Tamil village deity, **PLATE 5**, displays a surface syncretism in the Caribbean; he has taken to wearing business suits. But he should not be dismissed as an imposter or mistaken for a plantation driver. He is talking about modern times. He is code-switching.

Siva also evokes a variety of messages. This Caribbean murti **PLATE 6** is in the stylised orthodox Hindu tradition of representation; the murti indicates the female generative organs or *yoni* within which rest the male organs or *lingam*. The image represents Siva's androgenous creative energy. This Siva murti is particularly affecting because the Lord's lingam can be set to one side and his ever increasing seed exhibited. But this figurative standing Siva from Trinidad **PLATE 7** contrasts markedly from the orthodox view; here Siva is ***pitah***, the Mad One. Notice also the airbrush romanticism of the Great Tradition pictorial depictions of Siva, his consort Parvati and their infant resting at the feet of the murti.

Kalbhairo is a central figure in Mariamma imagery, brother rather than consort. In the Caribbean Kalbhairo is a vigorous, yet charming, well-groomed and poised gentleman **PLATE 8.** His India counterpart Bhairava shown in this Orissa *pat* painting from Puri **PLATE 9** is a little more frenzied in manner.

Plate 5

Plate 6

Plate 7

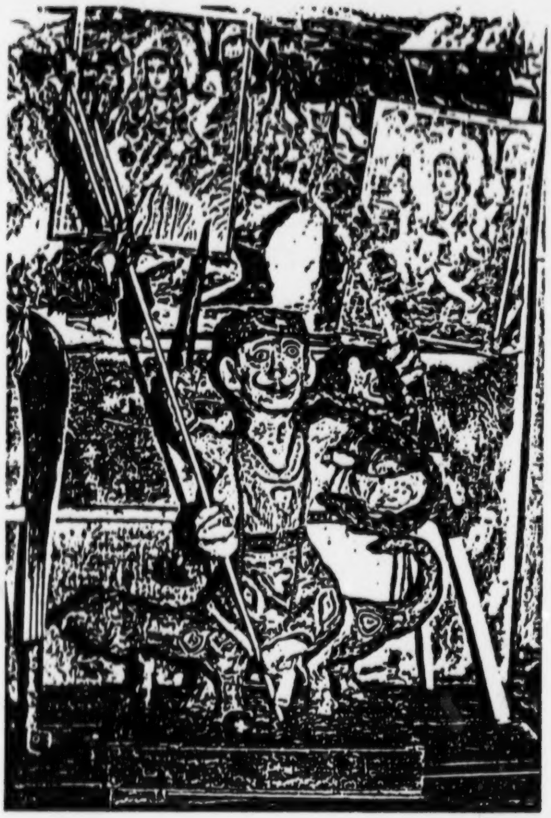
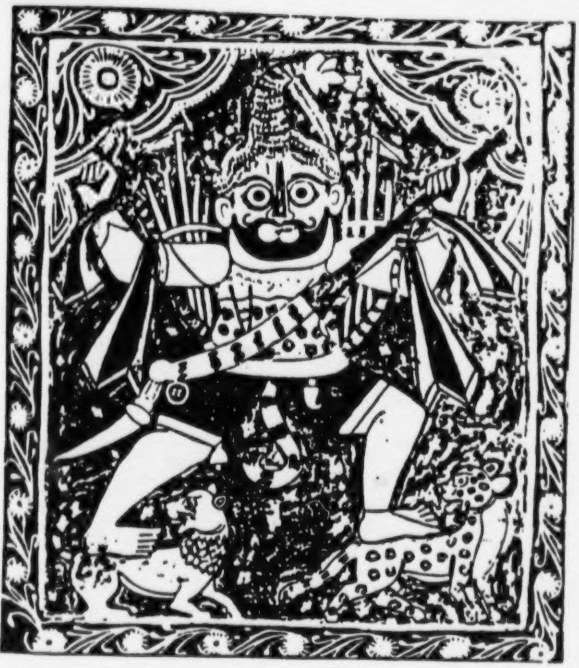


Plate 8

Plate 9



The most meaning-laden imagery is that of the Mother in her multiple guises. There is far more to hold our attention than can be introduced here. But I will illustrate the primary tension between Mother Kali's "terrible" imagery and her "mother" imagery. Here is the Mother at Albion, Guyana. **PLATE 10 .** Her right hands hold the sword and bowl of blood while the left hands hold her Shaivite trident and the hapless torso of her victim. While her "terrible" iconography is evident, she is a lovely matron with great dignity of bearing and a decidedly fair complexion. By contrast, here is Kali in a popular Orissan folk style **PLATE 11.** She is not a matron, but far from "terrible;" breasts and calves are firm and healthy, hair is lustrous; she is a modern woman, young, vibrant and bright blue. She is on the move. Both of these images are gruesome in formal symbols, but clearly pro-life in tone. Contrast these with this Bengali image, **PLATE 12**, a wonderful folk drawing created about 1890. This image treats darkness and death as central qualities, examples of Firstness in Peirce's terms.

Plate 10

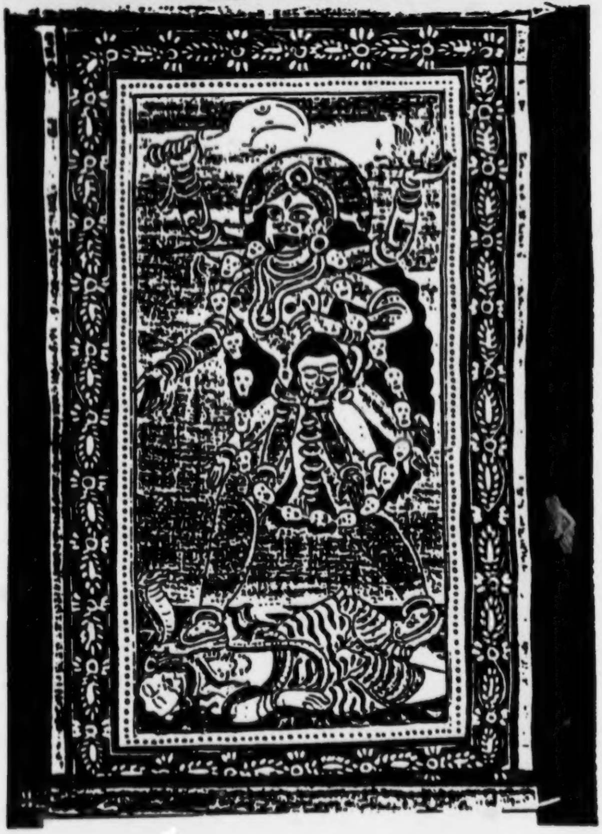


Plate 11

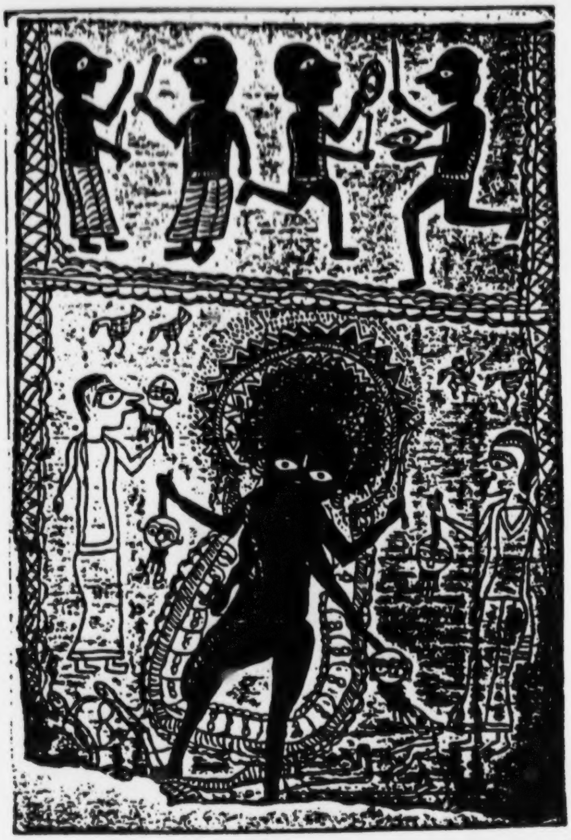


Plate 12

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The arrangement of the sequence of images I have shown you today are a reflection of the viewpoint I want to put forward. In the Great Tradition viewpoint we would have looked first at images of the Mother in her "classical" guise as reified at the important pilgrimage centers of Kali worship in India such as Calcutta, Benaras and Tirupati. Then we would have looked at the diaspora images to see how "well" they resemble the "important" images. If the diaspora images don't measure up we would probably decide that they are not culturally interesting. Or we would have looked for evidence of syncretistic influences from the other important cultures of diaspora environments.

Curiously, both the Great Tradition view and the Assimilationist view tacitly assume that if the ideas of Diaspora peoples do not come from one external source, Mother India, they must come from another external source, trend-setters of adjacent cultures. A more positive view of these murtis as examples of social action/speech production, as opposed to externally driven models, may help us to reach a richer sense of the deeper meanings these precious visual forms convey.

For the Diaspora Tamils in the New World the work of their culture is not simply the shadow play, a mimesis of their past. It is the voices of their present and future, resonant with the grammer and vocabularies and nuances of their shared historical odyssey.

Literature Cited

E. Valentine Daniel (1984) *Fluid Signs, Being a Person the Tamil Way.* University of California Press.

C.S. Peirce (1932) *Collected Papers* (volumes 1 - 6) edited by C. Hartshorne and P. Weiss, Harvard University Press.

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Plate Identification

1. "A Rite to Counteract Smallpox". Artist sketches to accompany the manuscript of Nicolo Manucci, 1703. Note translated from Manucci:

   "Illustration of a rite to counteract smallpox performed by the Indians when children or adults are taken ill. These unfortunates share the same superstitions as the ancient pagans; they make sacrifices to cure illnesses, fainting and all kinds of ailments that affect human nature. 1. A man dressed as a woman, balancing on his head five vessels full of a kind of holy water. He also holds branches in his hands, and others are placed in vessels. Men dressed in this way used to visit every house at certain times of the year, dancing and begging alms. It is believed that those who give alms to them will be preserved from the smallpox by the water and leaves they receive in return. 2. A pious woman offering rice in a basket. 3. A player holding two little hollowed cymbols made of copper, which he strikes together. 4. A drummer accompanying the player. 5. A drummer with his kettledrum taking part in the ritual.

2. FETE DU FEU en l'honneur de Darma-Raja et de Drobede. Engraved by P. Sonnaratpinx, printed by Poisson Sc. 1737.

3. Hanuman. Sanatan Dharm Maha Sabha Mandir. Bound Yard, Albion, Guyana. July 1984.

4. Hanuman. Contemporary Bazaar picture. India

5. Munis Prem. Moonsammy Kali Mandir, Spring Village, Curepe, Trinidad. January 1984.

6. Shiva Lingam with Shiva's Seed. Sanatan Dharm Maha Sabha Mandir, Bound Yard, Albion, Guyana. July 1984.

7. Figurative Shiva. Kali Mandir, Syne Village, Penal, Trinidad. September 1984.

8. Kalbhairo. Kali Mandir, Syne Village, Penal, Trinidad. August 1984.

9. "Bhairava, the 'terrible' form of Shiva, wearing a tiger skin and holding weapons, with tiger-dogs at his feet." Contemporary *pat* painting from Puri, Orissa.

10. Mother Kali. Kali Mandir, Sikkana, Albion, Guyana. July 1984.

11. Kali. Contemporary watercolor on rice paper. Bhubaneshwar, Orissa. 1985.

12. Kali in Terrible Aspect. Bengali folk painting on paper. circa 1890.

A Post Modern Inquiry into the Language of Art Criticism

Marytha Smith-Allen

Joseph Campbell, in his book and video series entitled *The Power of the Myth*, has placed the experiences of art and aesthetics within a mythological framework. In the light of his concept, I propose a reinterpretation of the language of art criticism to encompass the critical thinking aspects of synthesis and evaluation. Our present mode of art criticism is founded almost exclusively on the analysis aspect of cognitive thinking; my inquiry will address two of the higher thinking skills that have been little noted in the literature, and which I feel have an inter-connectedness.

The traditional language of critical phenomenology, as we know through the writings of Husserl and Merleau-Ponty among others, is difficult to translate into present-day encounters with art. Furthermore, any historical references we find in contemporary art are likely to be unhooked from any ongoing sense of history--more likely a random, personal linkage of past history to post-modern expression. The language has not caught up with the art experiences of today. Mythological implications have been considered unpragmatic; symbolic art has been suspect, and its art criticism on the symbol not pursued since Suzanne Langer's contributions to aesthetics.

The intent of this study is to examine an expanded context of synthesis, and the interfusion of what we value artistically and aesthetically, with an expanded language that enscribes, shares, and enlightens those perceptions.

In the Indian Upanisads, we read, "Where the eye goes not, the speech goes not, nor the mind" (Campbell, 1959, p. 51). How often it is that we hear, when someone is confronted with a work of art that is breathtaking, "There just aren't any words to describe it!" This experience is common to many. I recall a dear friend who meditated for about half an hour in front of Duccio's glowing *Maesta* that was beautifully lit in the cathedral in Sienna. She came out into the sun from that experience and was silent for another half hour, still meditating. On another occasion, I stood before a large painting by Franz Kline that was composed of a few heavy, thick black strokes. I could perceive the order in which he laid down those massive strokes and I responded to this discovery, not with words, but with tears for the very joy of participating in his process of work. These two episodes of intense encounters with artworks--here, executed six hundred years apart--are common to many who are moved by art. This is nonverbal art criticism, yet, without words, these responses remain on the level of private rapture, recalled for a lifetime perhaps, but, nevertheless, not widely shareable.

The purpose of art criticism, then in contrast to the very small circle of critical influence through nonverbal appreciation, is to share with many people a phenomenon of enlightenment, of an expansion of insight. The purpose of art criticism is to reveal, to recapture, to illumine--for others. The premise for this essay is this: the most recent kinds of critical thinking about art within the past fifteen years are different from the art criticism which has been dominant for the previous sixty or seventy years.

In order to examine Post-Modern critical thinking, one must examine the preceding mode of thinking about art--an art made during the long period of a century and called "Modern Art."

The characteristics of the so-called "Modern Art" were these:

1. It repudiated the Romantic traditions of representative content and sculptural space on the picture plane.

2. The artists of this "new art" were self-conscious about the way of working, of making the art pieces.

3. The stance of art was that it stands alone and is not subject to society's standards; it is "Art for Art's sake."

4. The flatness of the canvas in painting and the composition within the confines of that flat canvas were emphasized.

5. The results were flattened shapes, abstract uses of shapes and lines that were gestural at times, an emphasis on color that was seldom an "actual real life" color, or a use of obvious geometric structure across the canvas.

The outstanding and distinguished art critic of Modern Art in the twentieth century was Clement Greenberg, still alive and active, who summed up the history of Modern Art in this way:

> [Art] having been denied by the [17th century] Enlightenment all the tasks they could take seriously [was only] to be assimilated to entertainment....The arts could save themselves by demonstrating that the kind of experience they could provide was valuable in its own right....Manet's paintings became the first Modernist ones by virtue of the frankness with which they declared the surfaces on which they were painted...[this is] a purely optical experience... Modernism used art to call attention to art...Modernism criticizes [itself] from the inside (Greenberg, 1966, pp. 100-106).

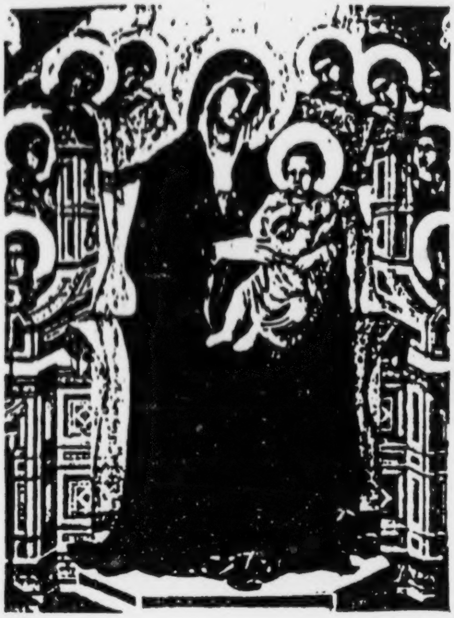
The Modernist sensibility grew out of the late nineteenth century philosophic theories, particularly Alois Reigl's "will to form" and Conrad Fiedler's "pure visibility." Modernism did not have a theory of its own until Roger Fry, a British artist, and Clive Bell, an art critic, in the early 1900s, synthesized Modernist practices into a Formalist Theory based on emphasis on "significant form," a solipsistic system of self-criticism, and the viewer's response (Burnham, 1973, p.16).

Artworks Cited in Text for Nonverbal Art Criticism and for Early Modernist Art

1a. Duccio of Sienna, *Madonna Enthroned, Maesta Altar,* 1308-11.

1b. Franz Kline, *Mahoning,* 1956.

1c. Edouard Manet, *Execution of Emperor Maximilian,* after 1863.



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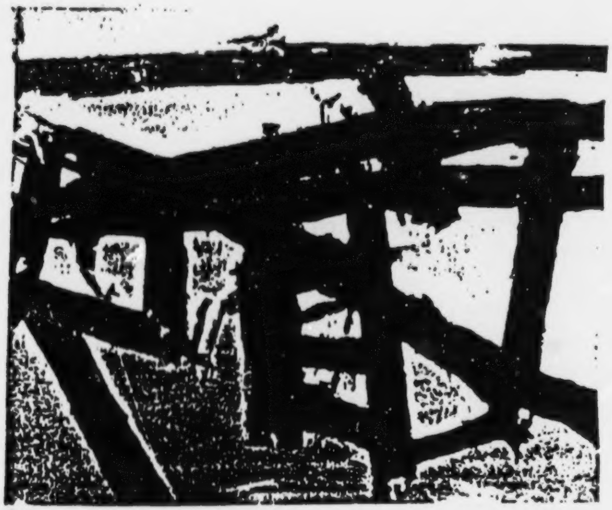

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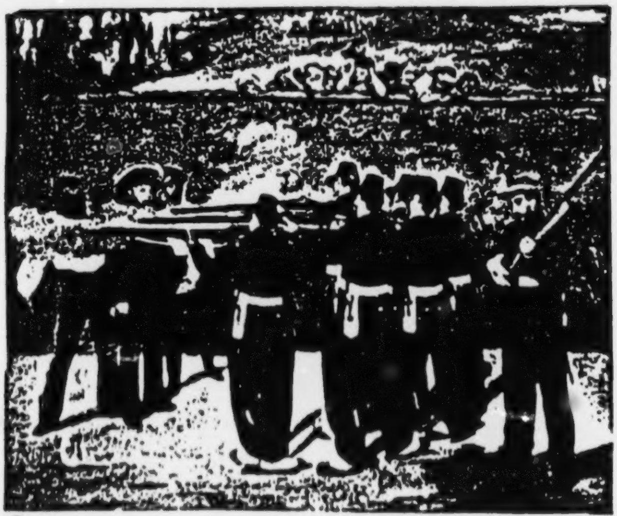

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However, by the 1960s, the label Modernism had lost its elasticity. Hilton Kramer, the *New York Times* art critic, claimed that its triumph was "remarkably hollow...indistinguishable from defeat." The critic Juergen Habermas was more concise: "Modernism is dominant but dead." Much of Modernism could not make room for the psychological content of Surrealist art, nor the pervasive presence of representational, figurative art throughout the twentieth century (Mitchell, 1987, p.76).

Whether we insist that Modern art, with its long tyrannical reign, began in 1863 with Manet, or with Pablo Picasso's African-mask-like portraits in 1906, or with Jackson Pollock's gestural drip paintings in 1951, we must nevertheless, acknowledge this: the way that many of us still "see art" is due to Modernism's training and its aesthetics of the Form, the Space, the Line and the Color. For some of us, this is the way we have worked for most of our artistic lives. The poet and writer, Barry Schwartz, spoke of critics who were only able to make connections between artworks that looked alike, failing to develop a "reasonable critique of the development of content in our time," believing that art was a steady progressive evolution of form (Schwartz, 1973, p.12). Modernist influences are so strong that the acutely perceptive critic Thomas Mitchell has said, "Postmodern will only appear when the content of Modernism is abandoned....We remain Modern" (Mitchell, 1987, p.76).

Two Important Modern Artists and Two Styles of Art Ignored by Modernists

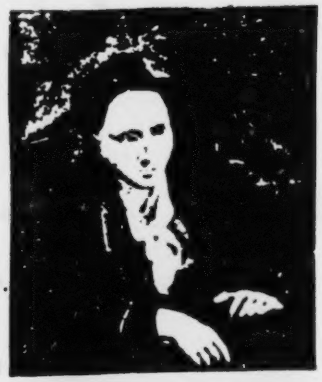
2a. Pablo Picasso, *Gertrude Stein*, 1906.

2b. Pablo Picasso, *Portrait of the Artist*, 1906.

2c. Jackson Pollock, *One #31*, 1950.

2d. Salvador Dali, *Apparition of Face and Fruit-Dish on a Beach*, 1983 (Surrealist).

2e. Edward Hopper, *Night Hawks*, 1942 (representational).



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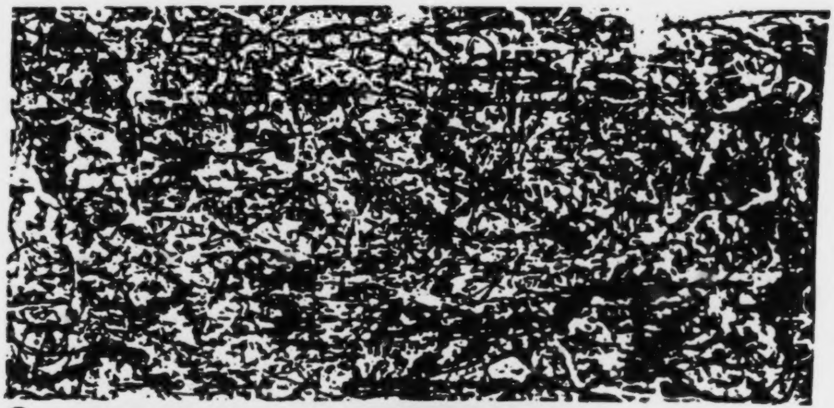

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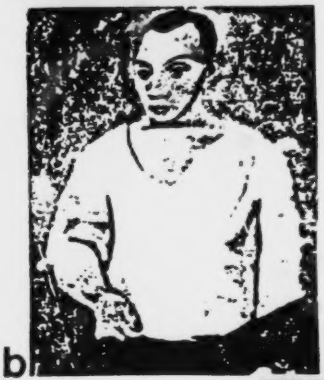

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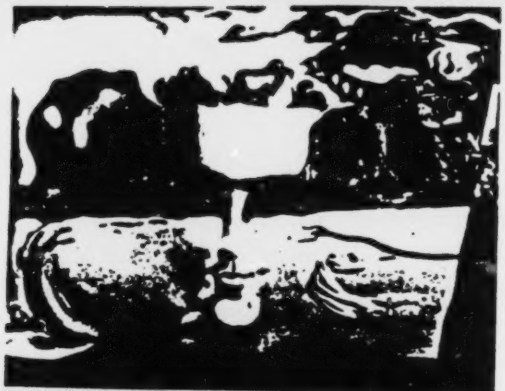

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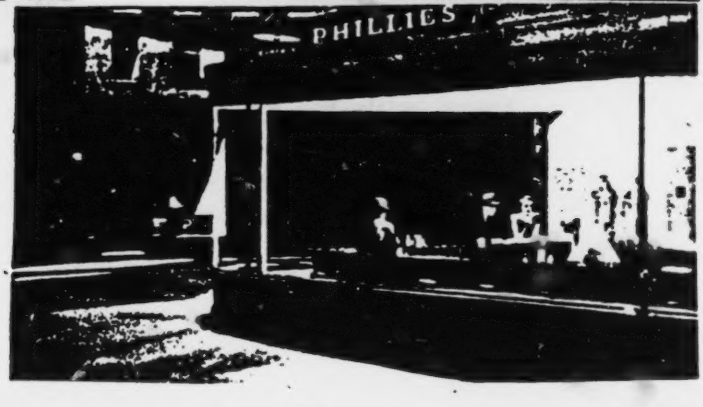

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What then is the Post-Modernism of the art world within the past fifteen years, and what is the language of its art criticism? By placing a capital M on "Modernism" in the label of Post-Modern, I am referring back to that prevailing art style with its specific type of art and with its specifically descriptive art criticism based on Formalist tenets. Woe to the artists who strayed from the fold.

There were many who did, however. The roots of Post-Modern art are based on a growing multiplicity of art forms. The pluralism of art being made around 1959-1960 had already crept in as a form of a rebellion against Modernism. Allan Kaprow, Robert Whitman, and Claes Oldenburg were presenting what they called "Happenings," a new form of art/theater which was unrehearsed, plotless, sometimes awkward, sometimes symbolic, and usually nonverbal. Michael Kirby was their most sympathetic critic and interpreter to the public (Kirby, 1965, passim).

Hard on the heels of Happenings was another art form: Pop Art (Popular Art) which drew its energy and impetus from the media-oriented, packaged and pampered culture of the early sixties. Foremost in the field was Andy Warhol who used a "series" approach of depicting one thing over and over again: Campbell Soup cans, Coca Cola bottles, Elsie the Borden Cow wallpaper, Marilyn Monroe, Jaqueline Kennedy (Onassis) in mourning. He then moved on to exceedingly long movies that celebrated the popular stance of ennui and tedium of the 1960s, such as the film *Chelsea Girls*; then he focused on himself, becoming a Pop image personified with his gaunt face and white wig. Even now, after his untimely death, his name means the cult of popular culture which is very much alive. In the 1960s, it was early commodicality," and in Warhol's words, "just a surface reason" (Smith-Allen,1983,p.43). The art critic, Robert Pincus-Witten, characterized his contribution to the art world as:

> Warholism, the manipulation of advertising and promotion as a central message of one's art... [is] the most recent "ignoble material" admissible since the Cubist collage... Warhol is an artist of... contemporary interests, while Warholism exerts its emphatic interest (Pincus-Witten, 1976, p.116).

Modernist art by the mid-1960s verged on gigantism in sculpture. An increasing use of technology in the revived interest in sculpture brought sculptors to industry where their ideas were fabricated and delivered to the site to be erected in situ. Oldenburg (of the Happenings) created a sculptural spoof of this trend with his 12-foot *Lipstick* which swivels up suggestively and is attached to a battle tank that moves it in place. *Lipstick* is now placed at Yale University when some of the graduates honored their famous fellow graduate.

As another rebellious gesture, the concept of "the mark of the hand" symbolized the artists' response to the proliferation of Cor-Ten cubes and neon sculptures, works installed by cranes or electricians. The artist, Mel Bochner, always made it clear that in his sculptual works, that he himself placed the stones or hickory nuts in configuration on the floor, that he had placed the tapes on the floor (snapping them precisely), and that the pennies he placed in logical fashion within the strips of drafting tape-- oriented to the points of the compass-- were executed by him alone. Such artworks were called Conceptual Art, based on various philosophical theories. Bochner's works were based on naming and classifying knowledge and on a fusion of language and perception, influenced by works of Wittgenstein and Foucault. Here is the way that several art critics wrote about a work of Bochner's, *The Theory of Sculpture*:

> Effie Stephano: "A gregarious circle game" (1973, p.47).
>
> Ellen Johnson: "[Bochner solved] actually one of the earliest and most persistent problems in the history of human thought-- how to unify the discrete and the continuous" (1976, p.213).
>
> Gregory Battcock: "Bochner is always precocious... at least never insulting" (1972, p.51).
>
> Rosalind Krauss: "Bochner's work...has been a consistent attempt to map the linguistic fact onto the perceptual one" (1976, p.43).

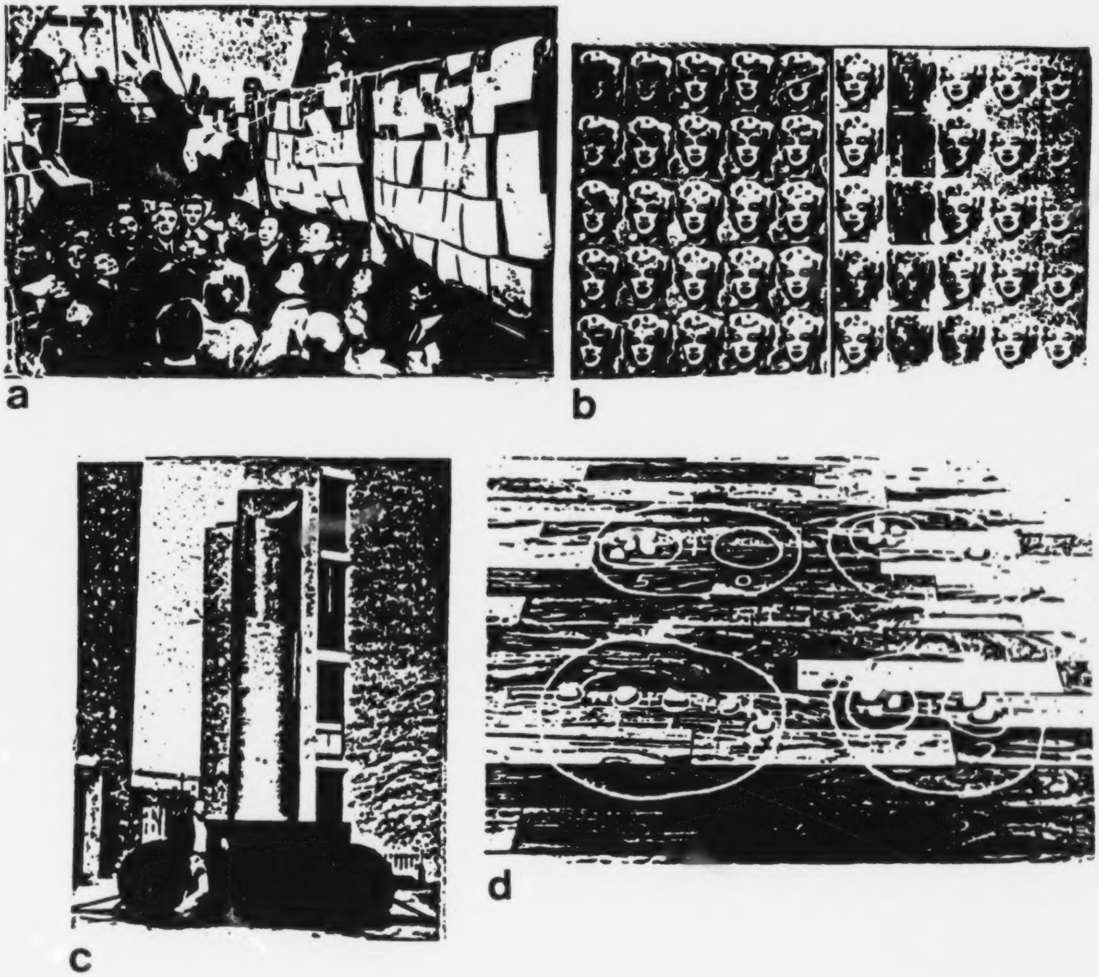
Three Illustrations of Pop Art and One Example of Conceptual Art

3a. Robert Whitman, *American Moon*, 1960.

3b. Andy Warhol, *Marilyn Monroe Diptych*, 1963.

3c. Claes Oldenburg, *Lipstick*, 1969.

3d. Mel Bochner, *The Theory of Sculpture #5*, 1972.



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Peter Schjedahl: "Bochner's shows are stunningly dull...couched in...visual stinginess" (1973, p.D32).

The eminent Clement Greenberg, confiding to his fellow critic, Pincus-Witten: "If I could concede to Bocher's point of view, it would turn my head around" (Pincus-Witten, 1978, p.126).

The term "Post-Modern" was coined by Leo Steinberg in a 1968 lecture at the Museum of Modern Art in New York (Mitchell, 1987, p.74). The title for the art of these latter years of the century has stood now for twenty years. The characteristics of Post-Modern art fall into five categories which I will develop more fully. These are: (a) Plurality and Realigning, (b) Recognition of Women Artists, (c) Changes in the Content of Art, (d) Recasting of the Aesthetic of Art, and (e) Self-Conciousness of the Nature of Art Criticism.

1. The Plurality of Art Forms and the Blurring and Realigning of Categories denotes a period of continuous diversity and fluidity in which art forms may reach back into history without any chronological progression or move out into non-Western, mythological, or space references. Correlations are made temporarily between literature, history and philosophy, or between semiotics, sociology and economics, or between aesthetics, art production and cultural analyis (Mitchell, 1987, p.21). Flat photography may be treated as a sculptural entity; audio- and video- tapes accompany large environments, ritual performances (much like Happenings) hark back to ancient myths with an urgent contemporary intention; computers design art that is based on Bach fugues, semiotics, simulation games, or patterns of how many games one wins at Solitaire. Art critics have to be tolerant of new approaches and uses of materials, sensitive to historical/political nuances--searching for an ever-fresh language.

2. The Recognition of Women Artists began in 1973 with several simultaneous occurrences: leading art journals began to feature articles about artists' lives and thought, rather than just their artwork standing alone (and we would add today, "standing alone out of context"); a spate of women artists' publications started; the significant Women in Art Conference was held at Widespread in Racine, Wisconsin; Eva Hesse, three years after her death, was the first woman to have a solo exhibition at the Guggenheim Museum; considerably more women began to exhibit their work in galleries; art critics were searching out women artists as well as alternative art by men that was not accepted by the gallery system. Many women artists work from a different sensibility than men, and this has facilitated a change within the American art world, which follows.

3. Changes in the Content of Art have come 180 degrees around from the Formalist "Art for Art's sake" thesis. The Modernist concern for the compositional values within each work has given way to Post-Modernist art

within a broader context, effected not only by the advent of women in the art world/system, but by men seeking out more comprehensive ground for their work. Notable among the changes are a concern for the earth, the elements of nature and its mythology; the large place of autobiographical material in the art; an emphasis on structures as shelters, dwellings, or special geographical sites; and, finally, works that speak to universal experiences of human beings, such as birth, celebration, or death.

Joseph Campbell (1959), the illustrious student of mythology, noted these forces in life which affect all humankind: gravity, the alternation of light and dark, weight and the pull of gravity, certain "poignant fears and delights," a sense of bearings, the spectacle of the moon and the night sky, the coincidence of the menstrual cycle with the cycle of the moon, the daily birth and death of the sun, the contrast of male and female, the cycles of birth and death (pp. 57-61). The changes in the content of art are much more liable to reflect this universal heritage.

For example, the artist, Vito Acconci, designed a programmatic series of art performances in an idiom called Body Art; this had developed in the very late sixties as a Conceptual interest in systems of knowlege about Being.

Examples of Art that Exemplify the Blurring of Categories, Ritual in Art, the Whitney Museum's First Women's Retrospective Exhibition, and a Concern for Earth

4a. The Starn Twins, *Crucifixion*, 1987.

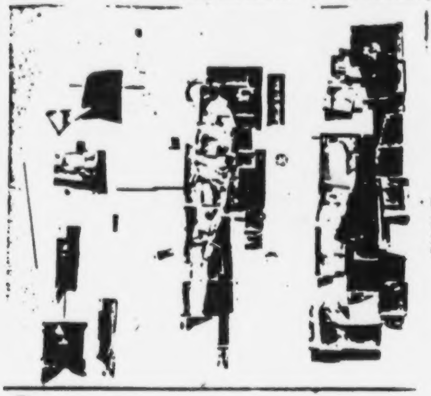
4b. Donna Henes, *Cocoon Ceremony*, 1979.

4c. Ana Mendieta, *Silueta de Cohetes*, 1976.

4d. Eva Hesse, *Sans II*, (50' long), 1968.

4e. Dennis Oppenheim, *Time Line* (detail), US/Canada boundary (to be obliterated when the ice melted) 1968.

4f. Christine Oatman, *Icicle Circle and Fire*, 1973.



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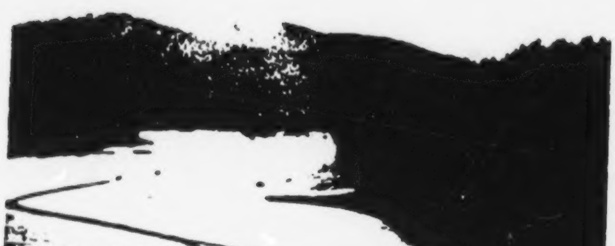

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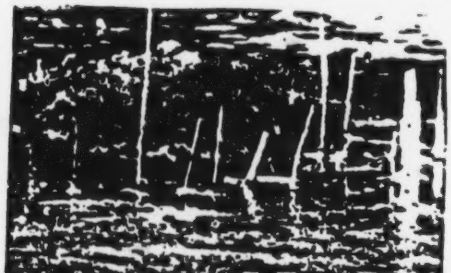

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Acconci began his continuum of exploration from the Self in physical space, the Self invading Other's space, to the Self sharing space with Others. The latest series, in 1988, was a group of imaginative houses for the delights and play elements of the Self and Others, shown at the Museum of Modern Art (Smith-Allen, 1983, passim).

One of the pervasive symbols of Post-Modern art is the spiral and its development into the maze. This is a universal symbol seen in various structures in the Mediterranean, Scandinavia, India, the Balkans, Java, Britain, and the southwest United States.

> Everywhere it symbolizes initiation and birth, death, and rebirth, the return to the center, or womb. The true labyrinth... has a single path to the center that traces every ring, moving away from the center before reaching it... [signifying] an opportunity for perception so fundamental that it demands a basic change in direction (Lippard, 1983, p.146).

In Post-Modern art, such a basic concept is expressed by a number of artists interested in such building of labyrinthine structures (Lippard, 1983, pp.147-149).

4. The Recasting of the Entire Aesthetic Supporting Art by Mitchell (1987) calls for an aesthetic that searches out the works of history which have stood the test of time-- like the mazes above-- and which provide relevance by the "infusion of mythic truths and values"; at the same time, the aesthetic needs to encourage a shift in "attitude toward time and space." Such an aesthetic must nurture the longings for rootedness, "the healing and exultation of both the individual and with each other" (p.76). In conjunction with this nonverbal longing, the aesthetic needs to provide the acceptance of art criticism that employs many kinds of language. Among these is the extension of language to an earlier tri-level comprehensiveness in which language does three things: names the object/idea, names its use or quality, and names its value. Verbal performance art attempts to do just this, as does ritual in art. Structuralist criticism about art, while not widely accepted in the United States, has also done this in the rest of the world, even though not labeled as such.

5. Self-Conciousness of the Nature of Art Criticism, it appears, (from the increasingly larger numbers of articles about the process of art criticism) is a new aspect of Post-Modernism in the art world. Art critics are now self-conscious of their roles and power in the art world structure. The amount of criticism about art criticism has proliferated. Critics are carping at the other critics: "The Trouble with Lucy" (Cameron, 1985, p.96), "Art World Cassandras" (Ratcliff, 1985, p.15), "The Dictatorship of Clement Greenberg" (Larson, 1987, pp.79-82).

Examples of Conceptual Performance Art about Exploring the Concept of Self and Others, Mazes in Prehistoric and Post-Modern Structures, Conceptual Work on Language and Art

5a. Vito Acconci, *Line Up*, 1973.

5b. Mazes at prehistoric sites: Babylonian palace, Coin from Knossos in Crete, New Grange and Rutland mazes, England.

5c. Mazes in Post-Modern art. Top: Terry Fox, 7"; Alice Aycock, 32' both in 1972. Bottom: Patrick Ireland, 3', 1967; Charles Simonds, 30", 1973.

5d. Mel Bochner, *Language is Not Transparent*, 1970.

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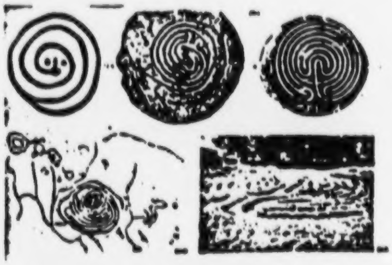

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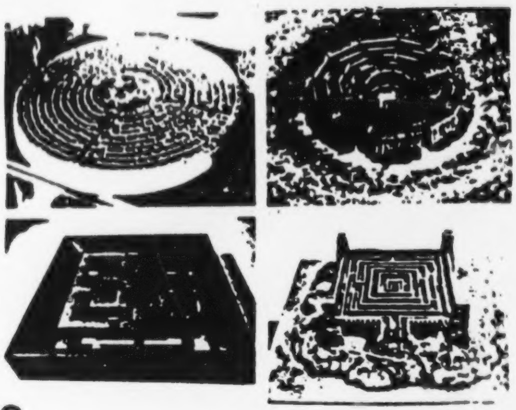

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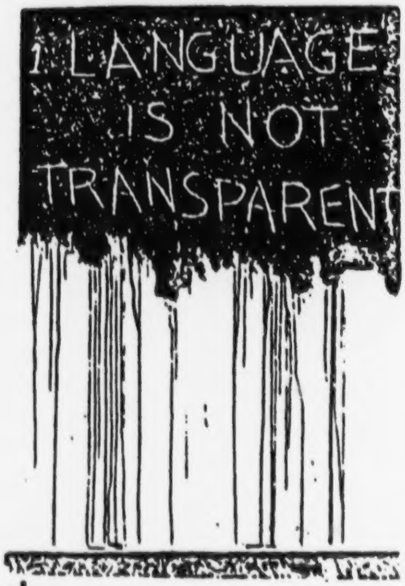

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Just as critics are quick to tar and feather those artists who change their mode of art and leave the critic's particular point of view on art-making, so are some critics shrill in besmirching other critics who change their minds about their point of view. Elitism is out, commodicality is in, and keep the readership stirred up to "be in the know" that "art matters." What does truly matter in art criticism are the underlying assumptions of critics: that "living up to the standards set by the earlier Modernist heroes" counts, that "faith in art's positive importance" counts (Ratcliff, 1985, p.15).

Because of the very nature of its ambiguity, the term Post-Modern is difficult to define. It is used broadly and variously in such disciplines as the visual arts, architecture, the media and communications field, in philosophy and theology, music, literary criticism and cultural analysis, and in politics. Each of these fields uses its own precise or loose interpretation of the term. For instance, it may ally itself as a style for post-Structuralism or capitalism, for current fashion or current revivals of historical art styles (Zummer, 1986, p.21).

Rather than define Post-Modernism as another "-ism," one could say that it implies "an organizing principle" that underlines various "strategies." These stategies are for "legitimizing claims for various social/political/aesthetic/symbolic interests" in ever new forms and combinations. And all this is done in what the writer Jean Baudrillard calls "an ecstacy of communication" (Zummer, 1986, pp.21, 23).

Post-Modernist art criticism moves beyond the intensively descriptive phenomenology which characterized some of the best criticism in the early years of Abstract Expressionism from the 1940s through the middle of the next decade. The highly focused relating of experience which the philosopher Maurice Merleau-Ponty developed with such perception and sensitivity influenced several generations of writers, artists, philosophers, and critics, and deepened the awareness that many have brought to the art encounter. It was, for the time of Modernism's latter strength, a most congenial companion. The "moving beyond" of Post-Modernism is, in a sense, a revival and yet a new appreciation of philosopher Suzanne Langer, whose thesis on art included both the context and symbolic meaning as part of an encounter with art (Langer, 1953, passim). Langer's work has been too little explored as of late, yet she has much to say to this Post-Modern age that is interpretive and enlightening. She was ahead of her time.

The Post-Modern period in art is not yet stable, and its very pluralism could lead to fragmentation were it not for our present "ecstacy of communication" via the media-- the leading art periodicals, the popular cultural newspapers, the constant references to art, even if it is the theft of a Van Gogh painting. The love that art demands of its devotees is part of the longing and searching for something of value in this time of change.

Joseph Campbell (1959) in his initial study of mythology which he called *The Masks of God*, spoke of Gerhart Hauptmann's saying that "poetry is the art of causing the Word to resound behind words." As a credo "writ large" upon art critics' hearts or foreheads, a paraphrase could read, "High [people in the arts love the sound of the word 'high']... High art criticism is the art of causing the Word to resound behind words." Campbell continued on, "In the same sense, mythology is a rendition of forms through which the formless Form of forms can be known" (p.55).

This is recasting Formalist art criticism into a new and inclusive dimension. The longing and the fear of the longing to make connectedness between the Word about the Form and the myth behind it is akin to the Medieval synthesis of bringing about an order, so that we might capture the revelation, that rapture of an art experience whole, and the words that illumine its value for others.

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Critical Thinking and Teaching

Critical thinking has a fundamental concern with teaching. In this final section of theoretic papers we present a number of attempts to grapple with the issue of teaching critical thinking in fundamental ways. John Hoaglund presents a careful analysis of one of the most persistent models for teaching critial thinking. Ludwig F. Schlecht, Jr. begins this section with a paper that analyzes the standard model of critcal thinking courses in light of recent objections. Bernard Davis explores an account of a basic problem in critical thinking instruction. Donald Henson attempts a general analysis of a theory that argues against general critical thinking courses. Finally Ivor Kraft uses the analysis of a personal experience to come to a judgment of the usefullness of teaching critical thinking.

Socrates and Critical Thinking offers John Hoaglund's analysis of the Socratic method as "one way of helping students to think critically." After describing the method, he responds to charges that the method is merely negative and incapable of yielding results. He then offers an analysis of critical thinking as the process of "internalizing the critic's own position" and recommends "how a fairly widely-used instructional device might better inculcate critical thinking in the Socratic sense."

Ludwig F. Schlecht, Jr. explores the question "Can critical thinking be effectively taught in a separate course?" in light of John McPeck's "denial of general reasoning skills" in his paper *Critical Thinking Courses: Their Value and Limitations*. He offers a careful analysis of "just what can or cannot be expected from critical thinking courses and the extent to which critical thinking is subject dependent." After looking at a variety of argument forms and methods of argument analysis and assessment, Schlecht concludes that "Some basic training in reasoning skills...can be provided in separate courses; but such courses need to be supplemented by other courses across the curriculum."

In his paper *A Linguistic Barrier to Critical Thinking in the Classroom*, Bernard Davis offers an analysis of "parascriptive" sentences; sentences for which "any conflict with the world is of no consequence." Parascriptive sentences properly and regularly occur in fiction and in ritual but they also may be "pathological." Such pathological occurences block critical thinking. The paper explores "ways in which parascription in the classroom may be discouraged or avoided."

Donald A. Henson, in his paper, *Critical Thinking and Contextualism*, speaks to the necessity and utility of a "a separate, specialized course in critical thinking, often included as part of the general education or core requirements." Identifying the challenge to such courses as "contextualism" Henson analyzes the claims, distinguishing five varieties of contextualism. After rejecting the four strongest versions, he shows how the weakest version --"pragmatic contextualism--while mistaken is nonetheless instructive in pointing out certain limitations of critical thinking courses, even though it does not entitle us to conclude that these courses are without justification or merit."

The final paper, *Theories of Justice, or Why I Quit Teaching Critical Thinking*, by Ivor Kraft, comes to an opposite conclusion based on Kraft's experience in teaching "required general education undergraduate courses in critical thinking." The author relates how when "propelled into an inquiry as to what he in fact knows about justice" in a critical thinking course, he comes to see the limited value of such courses as a contribution to "a student's deepened comprehension of such fundamental social issues as democracy, the arms race, justice, and the like." After an analysis of the central concept of justice, Kraft shows why he believes that general critical thinking courses constitute "a fruitless pedagogical mission... no matter how much he himself may find the materials interesting or stimulating or fun to teach."

Socrates and Critical Thinking

John Hoaglund

The ideas I am advancing to you today are offered in the spirit of encouraging dialogue on Socrates, his method, and how they may constitute a model for teaching critical thinking. My thesis is that this method as I interpret it here is one model for teaching critical thinking. I will first give an example of Socrates' method from Plato's dialogue *Euthyphro*, then a general description of this method. Next I consider a persistent minority interpretation of Socrates' method as negative and destructive. If this interpretation is correct, the method could not serve as a model for teaching critical thinking. I argue that it is not correct and present my evidence. Finally I explore the concept of internalizing the critic of one's own position, and show how one critical thinking instructional technique attempts to achieve this. This internalizing technique forms the basis for a positive interpretation of Socrates and his method.

In the sessions of this conference I have attended the last two days no individual has been mentioned more frequently in connection with critical thinking than Socrates. So I am going to assume some familiarity with Socrates and what he does, as well as a consensus that his activity relates to critical thinking. One of the best guides for students to the analysis of complex writing and the composing of the argumentative essay acknowledges its foundation in the Socratic method. Richard Paul, known to most or all of you as one of the leaders of the critical thinking movement, comments on the relation in these terms.

> The deepest intellectual roots of the critical-thinking movement are ... traceable to the teaching practice and vision of Socrates who 2400 years ago discovered by a probing method of questioning that many of the authorities of his day could not justify on rational grounds their confident claims to knowledge. Confused meanings, inadequate evidence, or self-contradictory beliefs were often lurking underneath smooth but largely empty rhetoric.

I will now go to the points relevant to my thesis. In turning to the *Euthyphro* I claim to be dealing with the historic Socrates, the one whose life and activity is corroborated by the other early Platonic dialogues and by several writings of the soldier and historian Xenophon, and whose teachings differ in important ways from those of the Socrates who serves as a spokesman for Plato's ideas in the middle and later dialogues. The curious listener must be referred to relevant scholarship for this view since it will not be defended here. The view of Socrates as a model for the teaching of critical thinking that I am developing here is informed by this excellent scholarship, but it is sufficiently distinctive to make it an entirely open question whether such scholars would accept it.

The issue in *Euthyphro* is how man should behave relative to the gods, and it is important to note just how this question arises. Socrates doesn't announce a lecture on it - it arises as a matter of practical importance to Socrates and his young friend. Socrates comes to the building of the King Archon, where those accused of religious crimes are tried, to read his indictment on charges of corrupting young people and inventing new gods instead of acknowledging the official dieties of Athens. He meets Euthyphro who (Socrates is startled to discover) has brought a charge of manslaughter against his own father (a religious crime because the lives of mortals belong to the gods, and whoever takes the life of a mortal may thus sin against the gods). To take so serious a step, Socrates suggests, Euthyphro must be quite certain of how mortals should act relative to the gods. When Euthyphro concedes that he is expert in such matters, Socrates requests instruction in proper behavior toward the gods, pointing out that it would help him in his own trial if he could get expert instruction in piety.

Now begins the part of the dialogue that exhibits the Socratic method. Socrates asks Euthyphro to explain what piety is in the sense of its having some one feature that makes it always identical to itself and the opposite of impiety. Euthyphro responds that pious behavior or behavior that is proper relative to the gods is like bringing charges for manslaughter, temple robbery, or other religious crimes. Socrates objects that Euthyphro has given him many 'pieties' instead of the one they agreed to seek, made identical to itself by always having some one single feature. So Euthyphro attempts again by explaining that pious behavior pleases the gods whereas impious displeases them. But Socrates points out that the gods do not always agree, so that what pleases Zeus may not at all please Chronos. But this would make one and the same action both pious and impious for pleasing some gods and displeasing others, and piety would be once again not identical to itself but to its opposite. And so Euthyphro is forced to abandon this attempted explanation of piety also.

Euthyphro makes several further attempts to explain what piety is, but each explanation is abandoned after being criticized by Socrates. At one point Euthyphro expresses frustration at seeing his definitions 'move' when he really wants them to stand fast, and the dialogue breaks off without him arriving at a definition that withstands criticism.

On the basis of this example, what is the Socratic method or elenchus (as it is called in Greek)? Out of a conversation a question arises about the nature of some moral quality like courage or justice, or about the nature of virtue itself. Socrates expresses puzzlement or ignorance of the quality, and his friend helps him with an explanation. Or as in the case of Euthyphro, Socrates presses him for a definition. The friend obliges. Then Socrates asks a series of questions that may initially not seem to bear directly on the definition, and that almost always must be answered 'yes' by his respondent. This questioning or cross-examining is the core of the Socratic elenchus. Finally Socrates adds up what his friend has conceded in his responses to these questions, and the total turns out to be contradictory to the proposed definition. So the attempted definition is abandoned. Then further such definitions are similarly attempted and abandoned.

This in essence is the Socratic method.

II

Now we turn to allegations that the Socratic method is negative and destructive, so that it cannot serve as a model for teaching critical thinking. It has been charged that this method:

1. is negative in that:
    a. Socrates always criticizes someone else'e explanations
    b. an adequate explanation is never achieved

2. is destructive in that:
    a. youngsters are frustrated in their search for knowledge
    b. the public humiliation deters them from further quests for knowledge.

Earlier I referred to the interpretation of the Socratic method as negative and destructive as a persistent minority view. It must have been held by a number of Socrates' Athenian contemporaries, and perhaps by a majority of those who voted to convict and put him to death in the year 399 B.C. It was defended by Polycrates in a writing now lost that appeared several years after the execution. It is defended with gleeful ferocity by the German philosopher and classical philologist Friedrich Nietzsche, and in a contemporary work by I.F. Stone.

But the case for the destructiveness of the Socratic elenchus has not been stated better than by Richard Robinson, for whom its central failing is a moral one. "The elenchus involved persistent hypocrisy; it showed a negative and destructive spirit; it caused pain to his victims; it thereby made them enemies of Socrates; it thereby brought him to trial, according to his own admission in Plato's *Apology;* and so it brought him to his death" (p. 62). Given these destructive aspects of the elenchus, Robinson inquires of Plato what justifies its use. Plato's response at *Meno* 84a-b is that the conceit of knowledge must be removed before one realizes he is ignorant and is motivated to learn. In the *Apology* (38a) Socrates claims further that it is a necessary condition of making people morally better. Robinson disputes that such mental gymnastics are a necessary condition of moral improvement. Only for Socrates, who equates virtue and knowledge, so that you must first know what virtue is before you can be virtuous.

The elenchus is, as Robinson holds, personal in nature, in that the person questioned must believe in his own definition or explanation and also accept the premises and accede to the argument that destroys it. In no other way can he be convinced of his own ignorance. But even in this personal sense, according to Robinson, the elenchus fails of its goal. It shows you only *that* you are wrong, not *why*. You would have to know *why* to exchange ignorance for knowledge (p. 90). Robinson also finds the insincerity and irony morally objectionable. "It is not possible to make men good by a kind of behavior that is not itself good"(p. 91). The irony made them angry, and they stayed angry and ignorant, so the elenchus failed to make them better.

We may concede that Socrates' method is negative in the two senses stated above yet still preserve what in the method contributes most to critical thinking.

1. The method is negative in the sense that Socrates is always criticizing the attempted explanations of others rather than advancing any of his own. If we interpret it as a method of teaching people how to think critically, the optimal benefit accrues to the student who states a belief and submits it to critical scrutiny. How the benefit occurs will be addressed below. No commensurate benefit could accrue to the student from having Socrates state his own views and submit them to criticism. As Robinson himself states, the elenchus works only when the student believes the proposition advanced. There is no good reason for thinking that any given student will share all or most of Socrates' beliefs. But it is an analytical truth that the student believes her own beliefs. So if the elenchus is to work with the student, she must state her own beliefs and let them be critically examined.

2. The method is also negative in that an explanation that is satisfactory or unassailable to criticism is never achieved. We could infer from this that a dialogue was a failure, or that the Socratic method was a failure, only if it were certain that the goal of the dialogue or method were to attain unimpeachable explanations. Such an inference would be extremely rash. Assuming that Plato's early dialogues are our best source for details of the Socratic method, and that Socrates' conversations with his companions frequently ended as Plato records, a more plausible explanation is that Socrates considered something more important than achieving unassailable explanations or elaborations of moral concepts. My contention is that he considered teaching his companions how to become critical thinkers superior in importance to attaining perfectly clarified moral concepts. If his method can succeed in making those on whom he practices it into critical thinkers, then marking it negative and a failure for not producing perfect definitions is like criticizing the archer who puts all of her arrows into the bullseye for failing to hit the barn. It quite misconstrues the goal of the exercise.

Robinson finds the method destructive in causing pain to those it was practiced on, and in making them angry and turning them into Socrates' enemies. We cannot concede that the method humiliates those it is practiced on and turns them from seeking knowledge if we want it (as we do) as a model for imparting critical thinking. So we must respond to Robinson's charge with a distinction between the uses or deployments of the method. In particular we must distinguish its use in contests between equals, where Socrates is seriously intent on refuting an opponent with his elenchus, and the more congenial application of the method with a companion for the benefit of that friend. In the former case Socrates is contending with a philosopher or orator of repute in a contest where each is trying his best to win. Examples of this are the joust with Thrasymachos in Book I of the *Republic*, and those with Polus and Callicles in the *Gorgias*. These particular opponents are indeed angry at the outcome of the Socratic elenchus, but not all such opponents are. Protagoras, for example, parts friends with Socrates after their contest in the eponymous dialogue. Whether Socrates should be faulted for defeating opponents in fair contests where at the start their chances of beating him are equal to his of beating them does not have to be decided for our case here. In my opinion he should not, and I find the penchant for interpreting history so that anyone who ever won anything fair or foul should return it or compensate the loser almost as widespread as it is wrong-headed.

With young companions like Meno, Euthyphro, Lysis, or Meno's slave, Socrates employs the method with a more gentle touch and humor. At *Meno* 75b he tells us his aim is more friendly than combative, that he restricts himself to true premises, and that these premises must be acceptable to his companion. Not only do his young companions delight in this exercise, they even appear to vie with each other for the opportunity of testing their wits against Socrates. There is in these encounters always something of the champ sparring a few rounds with a novice so the novice can test his own mettle. Thus the same sly wit and underhanded tactics are used to make the contest exciting.

Robinson's assessment that the outcome of these encounters is negative, that no one benefits, and that Socrates' opponents are perplexed, is incompatible with much of the evidence in Plato's early dialogues. Youngsters would never seek out this torture of public humiliation, yet they seek out Socrates and beg him to join their company. When he begins a conversation with one youngster in the palaestra, others gather round (207a). And Lysis practices on his friend the same tactic Socrates has practiced on him (211b). Nor is it always the case that their bewilderment led to anger, and their anger kept them ignorant. Euthyphro is certainly bewildered in the course of his interrogation by Socrates, and his dialogue breaks off without arriving at a satisfactory account of piety, but at no point is the youngster angry with Socrates. He obviously enjoys the company and conversation of Socrates, and would seek out both in the future.

We can understand why these youngsters would delight in the company of Socrates. We need to take into account his comical appearance, his wit, his interest in them, his sharpness, his reputation, and as well the range of amusements available to them. It is perhaps harder to understand how what he did benefited them. Socrates himself of course claimed that it did, and his companions apparently agreed because many of them attended his trial to testify on Socrates' behalf. The view adopted here is that he was helping them to wake up their minds and exercise them, and that the youngsters themselves sensed the benefit of this. Doubtless there is a seriousness of purpose in Socrates' employment of the elenchus with these young people. He would scarcely have staked his life on it otherwise. What they learned from Socrates may well have been a method of seeking the truth by a resolute and unflinching criticism of their beliefs. It improved them by making them realize that their beliefs had implications they didn't want to accept, and showing them how to search for more adequate beliefs.

Before we consider the process of internalization by which this occurs, let us draw together the strands of the argument thus far. My basic contention is that the Socratic method, the method in which Socrates criticizes explanations of moral virtues advanced by his companions, can serve as one model for teaching critical thinking. The method is negative in that it is always Socrates doing the criticizing and never advancing explanations himself. But this is the only way it can function as a method of teaching critical thinking, so this negativity is irrelevant. It is also negative in that the discussions never lead to unassailable explanations of the moral virtues. But since it is (if my thesis is correct) the teaching of critical thinking that Socrates sets out to accomplish, the fact that he does not arrive at irreproachable explanations along the way is regrettable but only as a minor blemish, or better, a bonus not attained.

To confront the allegation that the Socratic method frustrates and humiliates the subject, I distinguished its use in competition among equals, where this is sometimes true, from its use with usually younger friends, where it is not. The delight of the youngsters in its exercise, and their seeking out of Socrates for more, is strong evidence against their being frustrated and humiliated. Even the Athenians who put Socrates on trial and to death realized that the youngsters were charmed by its execise rather than humiliated, although they were either too dense or morally exhausted by the loss of the Peloponnesian war to realize how it benefited those it was used on.

Let us now turn to further elucidation of the working of the Socratic method.

III

The Socratic method has been spoken of so far in terms of internalizing something valuable. What does it mean to *internalize* some content in this sense? The concept of internalization is itself problematic and in need of more elucidation than can be given here. But we must employ it because there is no better or more economical way to describe the working of the Socratic method. We can distinguish two uses of it by social scientists (there are certainly more but this suffices for our present sketch) and then adopt the one closest to capturing the Socratic method. In "Toward a Modern Approach to Values," psychologist Carl Rogers describes the internalization of a prohibition in an infant. The infant is in close touch with his own needs and is the center of his own values. Rogers explains how he comes to internalize a value that is originally external and foreign to him. He delights in pulling his older sister's hair, even more so for the obvious pain it brings her as witnessed by her outcry and tears. But the infant also desires affection, and his mother, with a staccato of 'No, Nos,' a slap, and isolation, cuts him off from this as punishment.

Gradually in order not to suffer this loss of affection the infant internalizes this basically foreign value of his mother and sister toward his action. There is a phase where after pulling or attempting to pull her hair again he castigates himself as 'Bad, bad boy.' Finally, when the value is securely internalized, he admonishes himself when he just *thinks* of pulling hair, which deters him from the act itself. As he further matures the very thought of pulling hair recedes and vanishes from his mind. This is what we call the internalization of a value, a prohibition.

This puts us on the track of the internalization that is of interest for critical thinking, but not very far along. Internalizing a behavioral veto puts us at the level of what John Dewey calls traditional morality, or doing what we are told by parents, authorities, or peers simply because we are told to do so. With this he contrasts a reflective morality where we decide what is right by comparing competing alternatives and weighing their merits. Dewey identifies Socrates as the inventor of reflective morality, on the basis that he challenges the received concepts of justice, courage, and virtue to either be justified on rational grounds or be rejected.

The internalization process that leads to such a reflective morality is more complex and occurs when the individual is more mature. G.H. Mead, in his *Mind, Self, and Society* is closer to it with his idea that we internalize the attitude of the person we're conversing with, anticipate his reaction to what we intend to say, then adjust our utterance accordingly. Mead refers to this as the conversation of gestures. "If I take the attitude of a friend with whom I am going to carry on a discussion, in taking that attitude I can apply it to myself and reply as he replies, and I can have things in very much better shape than if I had not employed that conversation of gestures in my own conduct." When I play on a baseball team, for instance, every act of mine is influenced by my assumptions about what my teammates will do. I don't pause to see who's covering first base before throwing out the batter on a grounder, nor do I wait to see the bunt laid down before I tear off toward second on a sacrifice. Mead explains this as my having internalized the attitudes of the other players on my team.

The attitude we internalize in critical thinking has aspects of that of a teammate with whom we engage in a common enterprise, and also of that of a parent who chastizes us for our own benefit. It is that of a critic who probes our position for weakness in order to strengthen this position by leading us to a better understanding of its rational foundation. The successful internalization of this critic or critical attitude is what enables us to advance beyond the narrow circle of our own ideas. As John Stuart Mill puts it so succinctly, "He who knows only his own side of the case, knows little of that." We may well need to expand our factual knowledge and our perspectives in order to produce this critical attitude in the case of a given position. Suppose for example that we as Americans advance the thesis that democracy is the best form of government. To probe this position, since we've only lived under a democracy, we need to inform ourselves of how people flourish or suffer under a monarchy or totalitarian system, then attempt to view democracy from that perspective.

In this light, the service Socrates performs for his companions is that of embodying the critic they must internalize in order to become critical thinkers. He could not achieve this goal if he simply anounced his own polished explanations, or advanced rough ones then improved them, expecting his companions to admire and adopt them. This would be at worst the wholly uncomprehending memorization of an explanation and at best the assimilation of Socrates' explanation with some glimmer of understanding. It would contribute little or nothing toward making these companions into thinkers able to supply the criticism necessary to put such explanations on a rational foundation or reject them.

To realize that helping others become critical thinkers is Socrates' goal is to illuminate those early Platonic dialogues that ostensibly break off short of their goal because they provide no entirely satisfactory explanation of virtue or courage. They actually report Socrates pursuing the quite different goal of making his young companions into critical thinkers. Writers like Nietzsche, Robinson, and Stone who consider Socrates' exchanges with these young interlocutors failures for not producing satisfactory explanations simply miss the point of the exercise. What is a failure in achieving an irreproachable explanation may very well be an excellent exercise in the teaching of critical thinking, much as in the children's fable what seems an ugly duckling may turn out to be a graceful swan.

Since this Hans Christian Andersen fable was certainly not among those of Aesop that Socrates was versifying while awaiting execution, we are brought to this question: to what extent was Socrates aware of what he sought to achieve in these question-and-answer sessions with his young companions? It would indeed be extraordinary if this promoter of the examined life were in the dark about the nature of his own main activity. It is important to note here that he considered in the *Apology* (37c-38a) the possibilities of the court releasing him to go into exile, or on the condition that he cease his philosophizing. If his main goal were really to polish up his explanations, he could have done this just as well off by himself somewhere. But he quite refuses to accept these alternatives. As he explains in *Euthyphro* (3c-e), the Athenians didn't mind his philosophizing so long as he kept it to himself. But this he could not do because he was a sociable creature and had to share his work with others. When Socrates says that the unexamined life is not worth living, that illuminates his activity as one of helping others to lead the examined life. This is also why he can state honestly in the *Apology* (30a-b) that in helping people lead the examined life he is providing the state an invaluable service. Also when Socrates explains his position as one of a midwife of ideas - he does not himself give birth to ideas, but attends their birth like his mother who was a midwife attended the birth of babies - we might better characterize his activity as engendering not so much specific ideas as the critical thinking or mind that his companions must exercise in order to establish their beliefs on a rational foundation.

IV

If we accept the Socratic method as one model of teaching critical thinking, it can provide a rationale for the pedagogy of the three- or six-hour critical thinking or informal logic course that is increasingly being offered at colleges and universities across North America. To judge from textbooks on the market and reports from fellow teachers at conferences and meetings, the most widely adopted organizing principle for such courses is argument analysis. Stephen N. Thomas gave this trend a powereful impetus with his outstanding teaching instrument *Practical Reasoning in Natural Language* in 1971. Michael Scriven did much to clarify the goals and contribute to the techniques of this endeavor in his *Reasoning*, and further innovations came in textbooks by R.H. Johnson and J. A. Blair, and Trudy Govier, and others. But the centrality of argument analysis as an organizing principle also holds for some texts that appear quite different outwardly, such as the one by economist M. Neil Brown and psychologist Stuart M. Keeley, *Asking the Right Questions*. For the questions they ask center on argument analysis or are readily associable with it.

What activities are carried out in such a course, and how do they relate to the Socratic model of critical thinking? Many of you are already quite familiar with this, so for those who would otherwise lose the thread of my argument at this point, a brief sketch must serve. By using examples of about two- to six-sentence length, students are taught to distinguish argument, or claims supported by evidence or reasons, from other uses of discourse such as narration or description. This takes a surprising amount of time. Very few college students have any training or much facility in identifying, analyzing, and evaluating reasoned discourse. They do not learn this in high school, they do not learn it in college skills courses like English composition or math, and they do not learn it in introductory disciplinary or survey courses. In fact, before the advent of the critical thinking courses we are now discussing, if they didn't learn it in the specializied courses in their major or minor, usually under the tutelage of an academic advisor or mentor, they didn't learn it at all.

Once this hurdle is cleared, attention focuses on the alleged support for the conclusion and whether it actually establishes it. Is the arguer in command of the facts? Are the premises true? Do we understand what the premises mean relative to the conclusion? What about the conclusion - is it unambiguous? Are any of the premises or the conclusion based on unstated assumptions that need closer scrutiny? Can we discover any of the common fallacies or mistakes in reasoning? Are the premises relevant to the conclusion, so that if true they provide support for it? Is there evidence not cited in the premises that might further support the conclusion? What evidence or counterarguments weigh against the conclusion? All factors considered, do we have a strong argument or a weak one?

Argument analysis is similar to Socrates' activity in questioning a companion about a position he has taken because he then offers evidence or reasons for the position for Socrates in turn to criticize. Usually the aspiring critical thinker learns to criticize the positions taken by others before learning to criticize his own.

Our vantage point of the Socratic method as a model for teaching critical thinking may help illuminate our teaching activity. We recall in Socrates' work with his young friends that he does not proceed with a distinction, however clever, or proposition unless it is affirmed and accepted by his interlocutor. At every important point his companion must accept or reject, that is evaluate and decide whether the proposition advanced is to be added to his store of commitments. By itself, analysis is a relatively empty exercise. It has little more claim to further critical thinking than any of a number of other intellectually stimulating activities, like playing chess or solving logical puzzles. Argument analysis cannot teach critical thinking unless it is carried out for the purpose of argument evaluation. The ultimate goal of every specific activity we carry out in argument analysis should be to help us decide whether the argument is strong or weak. This evaluating activity consumates the criticism of an argument and renders the process Socratic.

Often we neglect the step of evaluation in our critical thinking courses in one of these two ways:

1. We are working with material from traditional formal logics (most textbooks contain some such material), and the arguments selected to illustrate formal points are nonsensical or so uninteresting that we are unable or unmotivated to decide whether we can accept them.

2. We employ argument diagramming of the type pioneered by Stephen N. Thomas and tend to leave an argument behind as soon as we have identified its pattern. Without a full evaluation, argument analysis converts into pattern recognition, and our activity changes from teaching critical thinking into contributing to the development of a new formal logic. Both of these tendencies must be resisted if our course is indeed to serve the purpose of teaching critical thinking.

Lack of sufficient emphasis on evaluation, however, is not the greatest deficiency of many college-level critical thinking courses. Most of them have little or nothing corresponding to the crucial second phase of learning to think critically, internalizing the critic of one's position. What best serves this goal is the construction of arguments, in particular writing the argumentative essay, if we circumscribe rather carefully just what this activity comprises. The argumentative essay is written intellectual inquiry aimed at deciding whether a position provisionally adopted on a controversial topic is the most reasonable one by probing it for strengths and weaknesses, and weighing it against competing positions. The argumentative essay in this sense is not a persuasive essay in which the decision is already reached before writing begins which position is the soundest one, so that the essay itself is an exercise in convincing a given audience of the merits of the position.

Since the two quite different types of essay are quite often confused, let me advance two useful distinguishing features.

1. The only acceptable outcome of an argumentative essay in which some alternative thesis proves more viable than the one provisionally adopted is the abandonment of the original thesis in favor of this alternative. This is not a possible outcome in the persuasive essay, where the decision on the best position has already been made from the start and is not negotiable.

2. In any essay you are at times confronted with choosing words to fit your purpose. In the persuasive essay you have studied your readers, and at such a juncture you can choose words for their emotive impact on these readers. In the argumentative essay you cannot choose words on any basis other than their being the most accurate ones to fit their referents. When you yourself are seeking the most reasonable position, to choose otherwise would be to deceive yourself, a self-induced frustration. (Students of ethical theory may find choosing language that deceives oneself an excellent example of a contradiction in willing, a major factor distinguishing the Kantian position from the utilitarian.) At times the choice may be obvious, like between calling abortion the destruction of a fetus or the murder of a fetus. At time it is perhaps less so, like between calling abortion the destruction of a fetus or the killing of a fetus.

The first of these features is obviously Socratic. It is a characteristic feature of all the early or Socratic dialogues that investigate some important moral concept that initial and subsequent positions are criticized and abandoned. But as we have already seen, this is not necessarily merely a negative result. The process of criticism itself is what Socrates is teaching, and this in itself is more important than achieving a perfect definition of courage or virtue. We can concede that the dialogues do not achieve perfect definitions yet appreciate that they achieve something instead that was more important to Socrates- the teaching of critical thinking.

The second feature can be observed at *Apology* 17a-b, where Socrates renounces ornaments of speech and claims only to speak the unadorned truth, and also at 34b ff. of the same dialogue, where he refuses to use an emotional plea to sway the jury in his favor. It is found throughout the *Apology* in Socrates' insistence on explaining what he has done and on being judged for that without painting it in attractive colors for the jury.

Much more remains to be said about the argumentive essay and the challenges of teaching it as a critical thinking technique. But here I can add only the following without making an already long presentation intolerably longer. The person advancing a thesis must have some degree of commitment to it. This corresponds to Socrates' refusal to consider a position unless his companion asserted it as true, and it distinguishes it from the scurilous practice of some of the Sophists who argued both sides of a question with an eloquence exceeded only by their utter lack of commitment to anything but their own financial gain. But this commitment cannot be so strong that the position cannot be relinquished when it fails to stand the test of criticism.

Arguments must be advanced in support of the position, objections to these arguments must be considered and responded to; then arguments against the position itself must be taken into account and responded to; finally, alternative positions must be considered and reasons given for not accepting them as superior to the original position. At any point in this process the original position can be rejected in favor of one supported by better arguments and hence less vulnerable to criticism. These steps are essential to the argumentive essay. As you can appreciate they are steps that any good critic of a position would take, which makes writing this essay an ideal exercise in internalizing the critic of one's own position.

V

In support of the thesis advanced here that the Socratic method can serve as a model for teaching critical thinking, historical evidence is brought against the view that Socrates publicly humiliates young people and frustrates their search for knowledge. It is conceded that the Socratic method is negative in that it doesn't arrive at perfect explanations, but only to make way for the argument that not this, but making youngsters into critical thinkers, is the goal of that method.

An explanation is offered of how this method helps those it is practiced on become critical thinkers by first making them critics, then teaching them to internalize the critic of their own position. The Socratic method so understood is then offered as a rationale for the many critical thinking courses taught across North America that are organized around argument analysis. Taking this model as our guide, it was then urged that there is insufficient emphasis on argument evaluation in some of these courses, and also that the most promising teaching technique for the internalization of the critic of one's position, writing the argumentative essay, is found far too seldom in such courses.

In conclusion let me touch ever so briefly on the aspect of critical thinking that becomes prominent in the Socratic model. Robert H. Ennis has characterized critical thinking succinctly as "a practical reflective activity that has reasonable belief or action as its goal." Yesterday Harvey Siegel interpreted the critical thinker as one appropriately moved by reasons. And in the opening address of this conference, Matthew Lipman stressed practical judgment about how knowledge is to be put to use, and how action based on judgment is not so much rule-governed as it is self-correcting in situations involving indeterminacy, chance, and risk. The aspect of critical thinking that stands out most clearly in the Socratic model is the self-correcting one. When she internalizes the critic of her own position, the critical thinker corrects her own errors. This makes her thinking more self-sufficient and autonomous.

Notes

I'm grateful to Harvey Siegel for indicating the need for clarity in distinguishing negative and destructive aspects of the Socratic method. Plato's Earlier Dialectic, 2nd ed. (Oxford, 1953). The central chapters of this work are reprinted in The Philosophy of Socrates, ed. by Gregory Vlastos (Garden City, 1971), pp. 78-124, to which references are made here. (Boston, 1988), pp. 56, 62. Plato's Earlier Dialectic, 2nd ed., (Oxford, 1953). The central chapters minus one of this work are reprinted in The Philosophy of Socrates, ed. by Gregory Vlastos (Garden City, 1971), pp. 78-124, to which reference is made here. Journal of Abnormal and Social Psychology, Vol. 68 (1964), pp. 160-167. At Harvey Siegel's urging I have attempted to clarify somewhat the senses in which the Socratic method might be said to be negative or destructive. Now in its 3rd ed. (Englewood Cliffs, 1986). Logical Self-Defense, 2nd ed. (Toronto, 1983). Second ed. (Englewood Cliffs, 1986). A Practical Study of Argument, 2nd ed. (Belmont, 1987). For example, in Vincent Barry's Invitation to Critical Thinking (New York, 1984), which attempts to distinguish them. "The Critical-Thinking Movement: A Historical Perspective," National Forum (Winter 1985), p. 2. In Twilight of the Idols, excerpts translated and edited by Walter Kaufman in The Portable Nietzsche (New York, 1968), p. 476 ff. Jack Meiland, College Thinking (New York, 1981), pp. 18, 22-24. The Trial of Socrates (Boston, 1988). See e.g. p. 56: "Socrates was the master of a negative dialectic that could destroy any and every definition or proposition put to him." Lysis 203b. Apology 33d-34b. Apology 33d-34b.Journal of Abnormal and Social Psychology, Vol. 68 (1964), pp. 160-167. W.K.C. Guthrie, Socrates (Cambridge, 1971); Gregory Vlastos, "The Paradox of Socrates," The Philosophy of Socrates, ed. by Vlastos (Garden City, 1971), pp. 1-21; Vlastos, Platonic Studies, 2nd ed. (Princeton, 1981), Chs. 9, 10, 19, 20; Vlastos, "The Socratic Elenchus," Oxford Studies in Ancient Philosophy, Vol. 1 (1983), pp. 27-58; "The Historical Socrates and Athenian Democracy," Political Theory, Vol. 11 (1983), pp. 495-516; "Socratic Irony," Classical Quarterly, Vol. 37 (1987), pp.79-96. Guthrie, Socrates, p. 11. Phaedon, 60c-d. Apology 38a. New York, 1976. See above, p. 17. The best account of writing the argumentative essay is found in Chs. 4 and 5 of the Meiland work mentioned in n. 1, p. 1 above. It was developed for the honors program at the University of Michigan and requires considerable adapting to be of much use for students of average ability and background. E.g. in "A Conception of Critical Thinking - With Some Curriculum Suggestions," Conference 85 on Critical Thinking, ed. by J. Hoaglund (Newport News, nd [1986]), p. 14. In

"Critical Thinking and the Language of Inquiry." "Critical Thinking: What Are We Trying to Accomplish?" In "The Nature of Moral Theory," excerpted from the textbook Ethics (rev. ed., 1932) co-authored by Dewey and Tufts in Coming of Age in Philosophy, ed. by Roger Eastman (New York, 1973), pp. 233-236. Ed. by Charles Morris (Chicago, 1962), pp. 164-173. On Liberty, in Utilitarianism, ed. by Mary Warnock (London, 1962), p. 163.

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Critical Thinking Courses: Their Value and Limitations

Ludwig F. Schlecht, Jr.

I.

In recent years the need for greater emphasis on critical thinking has received considerable attention at all educational levels. There is widespread agreement that students should be given more encouragement to actively examine and assess beliefs and values rather than passively accepting whatever ideas they happen to be exposed to; further, it has been recognized that students need more training in the reasoning skills that will enable them to make sound judgments and reach responsible conclusions.

Many colleges have responded to this need by introducing courses in critical thinking into the philosophy curriculum to supplement traditional offerings in logic. The older logic courses tend to emphasize the formal analysis of deductive arguments. However valuable such courses may be, they have been increasingly recognized as having limited applicability in many contexts in which rational judgment is important. The newer critical thinking courses are designed to teach a broader range of skills which are necessary for a reasoned assessment of claims in diverse areas of ordinary discourse as well as in different academic disciplines. Typically, such courses have been developed to teach students how to recognize, analyze, and evaluate arguments they might encounter in various contexts and subject areas.

But can critical thinking be effectively taught in a separate course like this which is offered independently from an understanding of any particular subject matter? Are there really any general reasoning skills which can be taught and learned apart from field-dependent knowledge and methods of examination? Doesn't any rational assessment of claims depend upon subject-specific expertise? John E. McPeck has raised these questions and concluded that there are no general reasoning skills -- and thus there is no basis for separate critical thinking courses. Criteria for rational judgment are determined within different fields of study and activity, he contends; critical thinking must be learned in the context of the several disciplines.[1]

The denial of general reasoning skills and the rejection of separate critical thinking courses is a position which can be, and has been, effectively challenged.[2] However, while McPeck's thesis is flawed, he does have a point; it must be recognized that the rational assessment of claims does require substantive knowledge and often depends upon subject-specific expertise. If critical thinking courses are not without value, it must nonetheless be acknowledged that there are limitations as to what can be accomplished in such courses; the reasoning skills which can be learned there must be supplemented by material learned in other places.

What is needed is a careful assessment of just what can or cannot be expected from critical thinking courses and the extent to which critical thinking is subject dependent. This is the topic I wish to examine in the present paper. It is important to be clear ourselves, and to be clear with our students, as to what skills can be taught in a critical thinking course -- and as to the limitations of such a course. It is also imperative that we be clear with our faculty colleagues in other disciplines about what can be achieved in such a course; this is essential for faculty understanding of the role such a course can play in the curriculum.

II.

Although there is not complete agreement as to what 'critical thinking' means, John Dewey's definition of 'reflective thought' seems to capture what is central: "*active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it, and the further conclusions to which it tends*".[3] Robert H. Ennis defines it as "reasonable reflective thinking that is focused on deciding what to believe or do," and indicates that the term is used to designate a set of dispositions as well as a set of abilities.[4]

Critical thinking dispositions might include such qualities of mind as intellectual curiosity and honesty, objectivity, open-mindedness, respect for reason, concern for clarity, commitment to proportion belief to evidence, and the like. Such admirable attitudes are no doubt essential in all academic endeavors and are highly regarded in all persons involved in any activity where the assessment or justification of claims is appropriate. It might reasonably be thought that all educational experiences, from the elementary grades on, should stress and nurture these critical thinking dispositions. Surely all college courses should inculcate these intellectual virtues and show their importance and relevance in particular fields of study. Students must develop these dispositions over time; they need continuing encouragement and training throughout their educational programs. No deficiency in this regard is likely to be effectively remedied by means of a concentrated emphasis in a single course. A critical thinking course can indeed give some further support to the development of these dispositions, but in itself it is only one among many educational experiences which affect student attitudes.

There is little justification, then, for a separate critical thinking course on the grounds that it offers a unique opportunity for the development of critical thinking dispositions. The justification for such a course must be based primarily on the development of critical thinking skills or abilities. Let us examine what can and cannot be accomplished in this area.

Critical thinking abilities are those intellectual skills which are necessary to determine whether a claim is rationally justified -- whether there is sufficient basis for belief that a claim is true. Since any reasoned attempt to justify a claim can be understood as an argument, critical thinking abilities may be identified as including whatever skills are required to recognize, analyze, and evaluate arguments. These are the skills which receive attention, primarily if not exclusively, in critical thinking courses.[5]

A. Argument Recognition.

Any argument consists of a claim to be justified (the conclusion) and the reasons (evidence, premises) which are put forth in its support. What is required in critical thinking before anything else is a clear understanding of what an argument is and the ability to recognize one when it occurs. Recognition of an argument does not normally presuppose any special knowledge of the subject matter being considered. Familiarity with premise and conclusion "indicator words", and awareness of various contextual clues that are not subject-specific, are sufficient to enable one to spot an argument that is being presented. It is surprising, however, how many college students have difficulty in doing this. Perhaps because they have not been previously trained to, or frequently expected to, identify arguments, many do not readily recognize the differences between passages which attempt to justify a claim from those which are descriptive or explanatory. As is true with the development of any skill, some practice is necessary for one to be able to exercise the skill with proficiency. One significant, if elementary, contribution that can be made in a critical thinking course is basic training and extensive practice in recognizing arguments.

B. Argument Analysis.

Once an argument is recognized it is necessary to analyze it -- to identify just how the premises offered are arranged in support of the conclusion affirmed. Are all of the claims clear in meaning? Is the argument enthymematic, with missing premises or an unstated conclusion? If there are two or more premises, are they linked or convergent? Are there subarguments given in support of any of the premises?

It should be noted that all arguments presuppose some background knowledge on the part of those to whom the argument is presented. An understanding of the language and an awareness of general information which is common to the culture is assumed. Usually no more than this is required in order to analyze the structure of an argument. Students can learn to raise and answer the sorts of questions indicated above without having any expertise in the subject matter of an argument.

There are limits, however; some knowledge of a specific subject may be required to analyze some arguments. The meaning of certain claims may not be understood without such knowledge. Also, to recognize a missing premise in certain arguments -- a claim that might be obvious and taken for granted in a particular field rather than explicitly stated -- may require familiarity with the field in question. Nonetheless, the structure of most arguments can be identified without such knowledge; and even when such knowledge is required, it supplements rather than replaces the basic understanding of argument analysis that can be developed in a critical thinking course. General skills of argument analysis can be taught and learned just as can the ability to parse a sentence -- and these are skills which are applicable to arguments in any field of study.[6]

C. Argument Evaluation.

The evaluation of an argument requires an assessment of both the acceptability of the premises as well as the strength of the inference from the premises to the conclusion. An argument is cogent if and only if its premises are unproblematic and the inference is good. A good inference is one in which the premises provide a firm basis for the conclusion, *i.e.*, it is logically impossible (in the case of deductive arguments) or implausible (in the case of non-deductive arguments) to accept the premises without accepting the conclusion.

An argument is fallacious, and thus fails to establish its conclusion, if either the premises are unacceptable or the inference is flawed. Some inferences are flawed because the premises simply have no genuine relevance to the conclusion; the premises do not contain the kind of evidence that has any bearing on the truth of the conclusion. Other inferences are flawed because even though the premises may be relevant they are not sufficient to justify the conclusion. A good inference is one in which the premises are both relevant and sufficient to establish the conclusion. The evaluation of an argument thus includes an examination of the acceptability of the premises, the relevance of the premises, and the sufficiency of the premises. Each of these will be considered in turn.

1. The Acceptability of Premises. Since an argument is an attempt to rationally justify a conclusion, it must be addressed to some audience that the author hopes to convince by the reasoning offered. The premises of an argument are acceptable if and only if "it is reasonable for those to whom the argument is addressed to believe these premises."[7] Unacceptable premises thus include those that are false as well as those not known to be true by the persons to whom the argument is presented. The knowledge required may consist of generally recognized ideas and information -- truths readily available or commonly held in a given culture; and while even the most widely held views are fallible and not immune from criticism, unless there has been some doubt raised as to their truth, they can well function as premises for arguments. On the other hand, knowledge of a more specialized sort may be necessary in many arguments -- knowledge that is based on study in a particular subject or field of inquiry. Whatever general or specialized knowledge of substantive claims -- or familiarity with particular perspectives and modes of understanding -- is needed, a critical thinking course can do little to meet this need by itself.

A critical thinking course can call attention to the importance of this criterion for argument evaluation; an argument can only be as good as the evidence upon which it is based. Furthermore, common premisory fallacies can be identified -- certain problems with premises that we can be alerted to and thus more readily detect: *e.g.*, premises that are inconsistent or that beg the question. Some general criteria can be developed for identifying whether authorities or other sources of information are reliable. But more than this -- the substantive knowledge that is required as to whether the reasons offered in an argument are true and undistorted -- cannot be provided in the course but must be gained elsewhere.

Because so little can be done in a critical thinking course to provide any basis for assessing the acceptability of premises, the importance of this condition of argument cogency is sometimes minimized or ignored in such courses; in argument evaluation attention may be focused almost exclusively on assessing the strength of the inference, as has been true in traditional logic courses. The tendency to identify rational assessment with inference evaluation alone gives support to the pernicious view that a good argument can be constructed to justify anything at all, and that therefore reasoning is a very limited tool for discerning or justifying what is true! A good argument -- one that justifies the acceptance of a conclusion -- must have acceptable premises as well as a good inference. The importance of the criterion of premise acceptability should not be neglected even though an assessment of premises requires knowledge that a critical thinking course itself cannot supply.

2. The Relevance of Premises. Premises are irrelevant to a conclusion if their truth value is completely independent of the truth value of the conclusion. Knowledge of relevance once again depends on what an individual has learned in a culture or in specific programs of study. The knowledge necessary to make assessments of relevance is not something that can be adequately provided in a critical thinking course.

Such a course, however, can help students to identify and be alert to certain fallacies of relevance -- common errors in reasoning that result from assuming that premises are relevant to the conclusion when they are not, errors that can occur in argumentation in any subject area. It is perhaps surprising to note how many arguments are found to be persuasive by people even though the evidence presented has no bearing at all on whether the conclusion is true. It is often not a matter of ignorance of subject matter that is the problem, but rather a matter of being taken in by something in the argument that is misleading or confusing. In some cases this is due to a shift in meaning in the use of an ambiguous expression; a person may fail to recognize the linguistic problem and thus fall prey to the fallacy of equivocation. Other arguments have premises which include diversionary material or emotional appeals; fallacies such as straw man, *ad hominem, or ad populum* may be the result. A critical thinking course can provide students with an understanding of some of these ways in which a person may be deceived or tempted to accept the conclusion of an argument even though the premises are logically irrelevant to it. And inasmuch as such fallacies of relevance are commonly committed, this contribution to skills in argument assessment is not insignificant.

3. The Sufficiency of Premises. In order to decide whether the premises in an argument are sufficient to justify the conclusion, it is necessary to determine whether the argument is deductive or non-deductive. A deductive argument attempts to draw out the implications of what is asserted in the premises; the premises are sufficient if and only if they logically imply the conclusion. In a non-deductive argument the conclusion goes beyond the evidence to affirm some generalization, causal explanation, or other consequence; the premises are sufficient if and only if they confer upon the conclusion some reasonable degree of probability.

a. Deductive Arguments. A deductive inference is a good (valid) one if and only if it is logically impossible (contradictory) to accept the premises without accepting the conclusion. Validity may be dependent upon semantics; for example, 'John is unmarried' is logically implied by 'John is a bachelor' by virtue of the meaning of the word 'bachelor.' The validity of most deductive arguments, however, is dependent upon their logical form alone. Once a deductive argument is identified as exemplifying a particular logical form or structure, an assessment of its validity can be made without regard to the subject matter being considered. For example, any argument whose form is *modus ponens* is valid; the premises of any such argument logically imply the conclusion. On the other hand, any argument which commits the fallacy of affirming the consequent is invalid.

Whether the premises of deductive arguments are sufficient to justify the conclusion -- whether such arguments are valid -- can be decided by utilizing techniques which are not subject-dependent and which can be taught in a critical thinking course. Indeed, the development of skill in assessing validity is often the sole objective of traditional courses in logic. While critical thinking courses recognize that reasoning skills must be understood more broadly, the ability to assess the validity of deductive arguments must be acknowledged as one important skill. It is something that can be learned independently of subject matter knowledge.

b. Non-Deductive Arguments. Non-deductive arguments are often identified as inductive arguments. Trudy Govier has proposed that the term 'inductive' be used in a narrower sense to identify only certain kinds of non-deductive arguments, namely, those "in which the premises and the conclusion are empirical -- having to do with observation and experience -- and in which the inference to the conclusion is based on an assumption that observed regularities will persist."[8] Two principal types of inductive arguments are enumerative inductions and explanatory inductions. 'Conductive arguments' is the term which Govier gives to an important class of other non-deductive inferences. Each of these will be briefly considered.

i. Enumerative Inductions. An enumerative induction is an argument in which a generalization about a population is inferred from premises which describe some sample of that population. Whether the premises are sufficient to justify the conclusion depends upon whether the sample is representative of the entire population with reference to the characteristic that is being examined. The size of the sample and whether it is randomly selected or stratified to reflect significant subgroups in the population are important considerations in determining whether it is representative.

A critical thinking course can help students to recognize the nature of enumerative inductions and to be aware of the general criteria that are relevant to their assessment. Furthermore, students can learn to be alert for grossly deficient generalizations, such as those which are based on a sample of one or two cases or on a sample that is otherwise clearly biased or atypical. The fallacy of hasty generalization is the label sometimes applied to such arguments. But a more sophisticated assessment of enumerative inductions depends upon considerable background knowledge. How large a sample should be is dependent upon how homogeneous or heterogeneous the population may be. Whether and how a sample should be stratified depends upon what subgroups are significant with respect to the characteristic being examined. The background knowledge required is sometimes a matter of what is generally known in a culture; however, specialized expertise may also be necessary for an adequate assessment of many such arguments.

ii. Explanatory Inductions. An explanatory induction is an argument in which an hypothesis is affirmed as the best explanation for the evidence presented in the premises. The hypothesis is most often one which asserts a causal relationship. To determine whether the premises are sufficient to justify a causal claim is a complex task to which a critical thinking course can make only a modest contribution.

A course can help students to understand the nature of such arguments and to recognize those that are deficient because of common fallacies. Two such fallacies that can be identified are the *post hoc* fallacy and the fallacy of assuming that correlation is the same as causation. Furthermore, the importance of some means to experimentally test an hypothesis can be stressed, and some general guidance as to what is needed (*e.g.*, the utilization of Mill's Methods) can be provided. But the actual process of experimental verification requires substantive knowledge and subject-specific expertise. So, too, does the application of other criteria for assessing the adequacy of a causal hypothesis, such as the scope of the hypothesis, its simplicity, and its consistency with other knowledge.

iii. Conductive Arguments. Non-deductive arguments in which two or more premises independently provide support for a conclusion might be called conductive arguments. Such arguments with convergent premises have also been labeled 'good reasons arguments.' They are "common in reasoning about conceptual and normative issues -- how phenomena are to be classified or what should be done. Also, they are common when there are disputes about interpretation."[9] When judgments need to made in situations such as these, various considerations relevant to an issue may be put forth to support a position. An assessment as to whether these considerations are sufficient to justify the conclusion reached depends almost entirely on knowledge of the subject at hand. To determine how strong the evidence is and whether it outweighs counterconsiderations which may be acknowledged or unacknowledged in the argument, requires considerable familiarity with and understanding of the topic. The topic may be one that falls within a particular field of study and requires specialized expertise, or it may be one that must be addressed by means of thoughtful examination of a more general nature.

There is little that can be taught in a critical thinking course that will be helpful in assessing conductive arguments. Students can learn to identify such arguments and to be attentive to whether premises are acceptable and relevant. But there are no general principles that can be formulated for assessing whether premises are sufficient to justify the conclusion. This may be the reason why such arguments are given so little attention in many critical thinking texts and courses. However, since conductive arguments are so frequently encountered, their existence should at least be acknowledged in critical thinking courses, and whatever general guidance can be given in evaluating them, however little it may be, should be provided.

III.

The results of this examination as to what can be taught in a separate critical thinking course -- and what its limitations are -- can now be summarized. Much can be done to develop skills in recognizing, analyzing, and evaluating arguments -- skills that are generally applicable regardless of subject matter. Students can learn something about the nature of argumentation; they can learn to distinguish different kinds of arguments and to understand the criteria relevant to determining the cogency of each; they can learn to identify and to be alert for some of the more common fallacies in reasoning. But substantive knowledge is also essential in many facets of argumentation -- knowledge which may be general or rather specific. In assessing arguments, such knowledge is needed in determining the acceptability, relevance, and sufficiency of premises. The degree of subject-dependency in assessing the sufficiency of premises is least in deductive arguments, greatest in conductive arguments.

Critical thinking courses, then, can assist students in developing basic reasoning skills, although such courses cannot provide an understanding of all of the information, methodologies, or perspectives which may also be necessary for the assessment of arguments in various subject areas. However valuable it may be, what can be taught and learned in a critical thinking course is not in itself sufficient to enable students to make rational judgments in all contexts.[10]

It might be observed that in many respects critical thinking courses are analogous to courses in freshman writing. A brief exploration of the parallels that exist may help to further clarify what can be expected from a critical thinking course and will conclude the present discussion.

Skills in writing and critical thinking are essential in all academic disciplines. Students come to college with some level of proficiency in each of these skills, although their abilities vary considerably. The further development of these skills is a college-wide concern, although some basic training in each may be consigned to a particular course; such a course is best taken near the beginning of a student's college program, and may or may not be required. Separate courses in writing or critical thinking give special emphasis to the importance of those skills and allow for an intensive experience in learning how to exercise them. Such courses can help students to further understand the norms that must be adhered to for clear and effective writing or for cogent reasoning. Most importantly, perhaps, these courses provide an opportunity for extensive practice in constructing essays or in analyzing arguments, practice which is essential if students are to develop a high level of competence in these skills.

Although writing and thinking must always be about something, the emphasis in these courses is on learning basic skills needed to write or think well rather than on learning subject matter. The skills developed are generic and applicable in any subject area. What can be learned in such courses must be supplemented by considerations that are learned in other contexts and which may be subject-specific. The skills developed in freshman writing must be supplemented by knowledge of the subject that is being written about and how that material can be best organized and developed; furthermore, students must recognize that in different disciplines certain writing styles are required or different forms for citing references are appropriate -- all things that are learned outside the writing class. Likewise, as we have seen, the critical thinking skills that can be learned in a separate course need to be supplemented by the general or specific knowledge that is essential for argument assessment in various subject areas.

Not only do the skills developed in writing and critical thinking courses need to be supplemented by knowledge that can be learned in other courses, these skills need to be regularly utilized in other courses if students are to become accomplished practitioners. Efforts are currently being made at many colleges to institute programs in 'writing across the curriculum' to enhance opportunities for student growth in writing proficiency beyond what is possible in a freshman course. Similarly, there is a need to develop 'critical thinking across the curriculum' if the basic reasoning skills learned in critical thinking courses are to be adequately encouraged and applied.

Notes

1. John E. McPeck, *Critical Thinking and Education*, (New York: St. Martin's Press, 1981). This is a position which also seems to be prevalent at the critical thinking conferences which have been held at The University of Chicago in the past few years.

2. See, for example, Perry Weddle, "McPeck's Critical Thinking and Education", *Informal Logic*, vol. vi, no. 2 (July, 1984), pp. 23-25; Harvey Siegel, "Educating Reason: Critical Thinking, Informal Logic, and the Philosophy of Education. Part One: A Critique of McPeck and a Sketch of an Alternative View", *APA Newsletter on Teaching Philosophy*, Spring-Summer, 1985, pp. 10-13; "Part Two: Philosophical Questions Underlying Education for Critical Thinking", *Informal Logic*, vol. vii, nos. 2 & 3 (Spring & Fall, 1985), pp. 69-81. Although I do not intend to review the objections to McPeck's thesis, my differences with him will be evident in my attempt to identify what reasoning skills can be taught in a critical thinking course. It should be noted that acceptance of the thesis that there is no common understanding of rationality applicable across disciplinary boundaries -- no general rules of argumentation and no general rational skills that can be identified and taught -- would have profound implications for curriculum planning in general, not just for critical thinking courses.

3. John Dewey, *How We Think*, (Boston: D. C. Heath & Co., 1910), p. 6.

4. Robert H. Ennis, "A Conception of Critical Thinking -- With Some Curriculum Suggestions", *APA Newsletter on Teaching Philosophy*, Summer, 1987, pp. 1-5.

5. There may be critical thinking skills needed in problem solving or decision making which go beyond those found in argumentation. Consideration of these skills, if there are such, is not common in critical thinking courses, and will thus not be included in my discussion of these courses.

6. Simple diagramming techniques can be utilized to assist in making clear an argument's structure, just as diagrams may be helpful in the grammatical analysis of a sentence. See, for example, Trudy Govier, *A Practical Study of Argument*, second edition, (Belmont, California: Wadsworth, 1988), chapter 6, "Fitting Things Together: A Diagramming Technique".

7. Govier, p. 62.

8. *Ibid.*, p. 260.

9. *Ibid.*, p. 248.

10. In addition to the limitations of a critical thinking course that have been discussed, there are also some limitations as to what can be accomplished within the time constraints of a one semester course. Because of limited time, not everything that can be done, is done. Often certain aspects of argumentation that could be included are slighted or omitted altogether. For example, the arguments which are considered in such a course are normally no longer than a paragraph in length; the analysis of extended arguments is seldom given much attention. Also, the primary focus is on analyzing and assesssing arguments that have been presented by others rather than on learning how to generate clear and cogent arguments to present to others. (Further emphasis on argument construction in freshman writing courses to complement the emphasis on argument analysis in critical thinking courses might help to remedy this latter limitation.)

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A Linguistic Barrier to Critical Thinking in the Classroom

Bernard Davis

Much of what is learned in school falls on the wrong side of a linguistic barrier. Because of this barrier we are likely to be thwarted in our aims for the development of critical thinking in the classroom and for the transfer of critical thinking from the classroom to life. This barrier is essentially the same barrier that separates prescription from description and makes the naturalistic fallacy a fallacy.[1] But school learning often falls in such a position vis-`a-vis this barrier that both prescription and description are excluded.

This barrier is not necessarily marked by special words or syntactic forms. Prescriptive sentences may contain "should" or "ought". They may not. They may be expressed as imperatives. They may not. Consider the measurement rules for dinghies. The description of the International Finn dinghy states that the centreboard extends 3'4" below the hull. But, if your centreboard extends 3' 6 1/2" below the hull, the official measurer doesn't say, "oh we were wrong, some Finn centreboards are longer". He refuses to let you race.

Recipes on the other hand are often written in imperatives, and we can use a recipe as a prescription, "follow" it, and make the dish. But we can also use it as description, perhaps to provide a list of ingredients for a foreign dish we have eaten abroad. And we can criticize it as a description--a recipe for New England clam chowder is not a true description if the ingredient list includes tomatoes.

Consider this scenario: You are a high school English teacher. You are at home on a Thursday evening completing an essay on the failure of spellings used on traffic signs to affect the English written in schools. In the text of your essay you have just written this sentence, "In high school English compositions the preposition 'through' is always spelled t h r o u g h." Deciding that this is a good time to take a break from composition you put your research project aside and pick up the next in a stack of essays written by your students.

The third sentence in the essay you pick up is, "The arrow hit the apple and went clear thru it." The preposition is spelled t h r u. Almost by reflex you write in the margin "In high school English compositions the preposition 'through' is always spelled t h r o u g h." Then you remember your own essay, you reach across the table, pick it up and. . .

Well, what do you do?

What you clearly must do if you are not to publish a lie is to strike from your essay the sentence "In high school English compositions the preposition 'through' is always spelled through."

But what of the same sentence in the margin of that student's essay? Can the student rightfully demand that it share the fate of its twin? After all, if she wrote "the arrow went clear thru it" in a high school English composition then it can't be true that in high school English compositions 'through' is always spelled through. Well can it? Does the student get the remark deleted, and get the point reduction it justified reversed, or doesn't she?

Again, what will happen seems clear, the remark remains, and henceforth she must remember to always spell 'through' through in high school English compositions. Her argument would have been inescapable had your remark been intended as descriptive, as your sentence in your research article on high school spelling was, but the remark on her paper you wrote as her teacher not as researcher, and it wasn't intended as a description at all but to give her guidance about expectations which you intended to enforce and which, perforce, she should meet.

Whether a sentence is descriptive or prescriptive depends on how it is accepted or is intended to be accepted. Accepting your sentence as descriptive the student had a perfect argument, but this wasn't how you had intended it to be accepted. And as her teacher you are going to insist that she accept it as you intended it.

I think this scenario has given us enough information to attempt definitions of 'prescriptive' and 'descriptive' that will account for the differences between descriptive and prescriptive sentences.

> 1a. A person accepts a sentence as descriptive if, should he discover that what it says is not the case, he will reject the sentence.
>
> 1b. A person intends a sentence as descriptive if he intends that those who accept it, accept it as descriptive.
>
> 2a. A person accepts a sentence as prescriptive if, should he discover that what it says is not the case, he will not reject the sentence but rather will do what he can to alter the world so that what the sentence says becomes the case.
>
> 2b. A person intends a sentence as prescriptive if he intends that those who accept it accept it as prescriptive.

What someone who accepts a sentence will do if he discovers that what it says is not the case is primary to this account of the difference between prescriptive and descriptive sentences.[2] The corresponding difference in the intention of the speaker or writer serves to show that this part of the meaning of the sentence is not limited to the interpreter of the sentence but can also be intended by a speaker or writer.

Should a descriptive sentence one accepts conflict with the world, the sentence must be rejected. It may be crossed out, denied, replaced by a modified or more qualified sentence, or even, if it is part of a theory or system of beliefs, have its unwanted consequence eliminated by the modification of some other sentences in the theory. One can do any of these. What one can't do is to simply accept the contrary evidence and continue to accept the sentence.

Should a prescriptive sentence one accepts conflict with the world, the world must be changed if this is possible and feasible. This may be easily done, the student crosses out thru and writes through on her next draft. This may be difficult, one may be reduced to exhorting others to change the world, either by directly asking them or by denouncing the current state of affairs. One may even be forced to decide nothing can be done, perhaps the event is already past or to act would be too dangerous. What one can't do is accept that the state of the world is not in accord with the sentence one accepts as a prescription, accept that one can, without difficulty, change the world so that what the sentence says will become the case, and do nothing.

If I tell you I agree that through should always be spelled through, but I go on spelling it thru in departmental memos and never correct my students when they write thru, you can reasonably argue that I am lying--my actions show that I don't really believe what I am telling you I believe.

But does accepting a sentence as descriptive or accepting it as prescriptive exhaust the possibilities, or are there other courses of action that might be taken should one discover that a sentence which he accepts is not the case? One further possibility would be both to reject the sentence and to attempt to change the world so that what the sentence says becomes the case. Since the result of doing this would be to create a situation to which one is no longer committed, this seems an ineffective strategy. I expect, nonetheless, that it sometimes occurs, but I will leave it to someone else to name it.

Another possibility is simply to disregard the discrepancy. This possibility is realized rather often, so I am going to coin an adjective to identify it.

> 3a. A person accepts a sentence as parascriptive if, should he discover that what it says is not the case, he will not reject the sentence and will not do what he can to alter the world so that what the sentence says becomes the case.
> 3b. A person intends a sentence as parascriptive if he intends that those who accept it accept is as parascriptive.

A parascriptive sentence neither depends for its truth on the actual state of the world as does a descriptive sentence, nor does it commit those who accept it to any attempt to prevail over some aspect of the world as does a prescriptive sentence. Rather a parascriptive sentence, as the name implies, simply stands beside the world. Like Euclidean parallel lines, it and the world continue on but never meet. If a sentence is accepted as parascriptive it is accepted in such a way that any conflict with the world is of no consequence. If it is intended as parascriptive then it is intended that it be interpreted in such a way that any conflict with the world is of no consequence.

Parascriptive sentences include many of the sentences which are found in works of fiction. If I begin a short story,

> "Through" is always spelled t h r o u g h. I can remember that at least from the days before the accident, before this impenetrable fog that hides my past. . .,

then I need not strike out the first sentence should I discover an example of "through" spelled t h r u, nor have I committed myself to such a spelling. I can, if I wish, go on to describe a world, in which everyone but my confused protagonist spells "through" t h r u. Individual sentences in a work of fiction may be accepted as descriptive or prescriptive, and a novelist may be charged with libel or with inciting to riot, but in calling a work fiction we are saying that some essential part of what is said therein is not intended to be accepted in such a fashion. "Any resemblance," the set denial goes, "is purely coincidental."

Another common parascriptive use is the use of sentences in conventional rituals. "I'm fine" in response to "How are you" is usually a ritualistic and hence a parascriptive sentence. We can contrast this with descriptive or prescriptive uses of the same sentences.

A descriptive scenario: rock climbing with the outing club you've lost your footing, fallen, been stopped by the rope, dangled momentarily, and regained a footing on the slope. "How are you?" yells your partner from above. "I'm fine," you reply and start climbing again. In saying "I'm fine" you have informed your partner that you are not injured or rendered incapable of further climbing.

A prescriptive scenario: it's last call at your favourite tavern, the bartender asks "How are you?" "I'm fine," you say and he moves on without giving you another drink, as you've told him he should. "I'm fine," as a prescription, asks that the speaker's present state not be altered.

The ritual greeting and response however, constitute neither a descriptive nor a prescriptive scenario. By "How are you" and "I'm fine," the parties affirm or reaffirm their acquaintance, but no real enquiry is made, and "I'm fine" says nothing as to the greeted person's health or well being. Should the greeted person launch into a detailed description of his state of health this would be considered out of place.

Parascriptive sentences occur regularly and properly in fiction and in conventional rituals. But parascription also occurs in cases in which its occurrence is pathological.

A homeowner who could easily pass a test on heat conduction and the conductivity of copper spends an hour trying to solder a pipe with the water still in it. An architect who would be offended if anyone questioned his knowledge of longitude, latitude and the angle of the ecliptic designs buildings suitable for Mexico for Canadian campuses, leaving students to shiver in dark atria into which the sun never shines. A citizen picks up the daily newspaper to read what has happened in the TV "soaps" and then reacts to the national and local news in the same way--as a form of serial entertainment.

The expectable result of sentences being accepted as parascriptive in cases where prescription is in order was found in an experiment some students of Leonard Bickman ran on a university campus.[3] Sheets of crumpled newspaper were placed in the middle of a campus path. After passing this obvious pile of litter, subjects were asked, "should it be everyone's responsibility to pick up litter when they see it or should it be left to the people whose job it is to pick it up." 94% responded that it was everyone's responsibility, 1.4% picked up the litter. Some of the other 92.6% of those observed may have been hurrying to class and been too rushed to stop, or have had a bad back and been unable to bend over, but it seems a reasonable hypothesis that for most their verbal response was parascriptive, a ritual of verbal agreement perhaps.

But what I want to speak of here is the parascriptive learning that occurs in our classrooms.

I vividly recall one example from a junior high school geography class. Students were filling in a form for each European country with the name of the country, the area, the population, the primary products, etc. The country for that day was Iceland. One student found that the figure provided for Iceland's population in the text was about three-fifths of the figure provided by the Atlas. He asked the teacher for clarification and was told, "You can use either one, they're both in the books."

That answer revealed a disturbing fact--the activity those students were carrying out had a lot to do with filling in blanks by copying from books but nothing at all to do with the characteristics of Iceland. The actual population of Iceland was totally irrelevant to the sentence "The population of Iceland is __________," as it appeared on that form in that class. The intention which the teacher's response revealed was that the sentence be accepted as parascriptive.

By extension, so far as that class and its tasks were concerned, all the sentences on all the forms for each country were parascriptive, and the sentences in the Atlas and the textbook were parascriptive. Together they made up, not a description of part of the real world, but a huge dull novel, a novel with no plot, no protagonist, but lots of setting.

I also recall a demonstration in a science class. A demonstration which was to show that yeast will convert sugar to alcohol but it won't convert starch. So yeast flour and water were mixed in one test tube. Yeast, sugar and water were mixed in another. After a few minutes an indicator was added. It changed colour in both test tubes, showing alcohol in each. The rest of the class was spent explaining why the indication was false, through various speculations about contaminated starch, dirty test tubes, etc. Scientific truth, after all, is what the science text says.

Even discovery learning is not exempt. I have seen a student pull a brick across the top of a desk with a spring scale and dutifully record the force of friction for wood. The desk, as he pointed out, was wood, except for a few metal fastenings and a formica top.

Anyone who spends much time in schools can collect innumerable examples of parascriptive teaching and learning. John Holt filled a whole book[4] with examples of parascriptive learning, of teaching that made no sense to the student and of answers that 'just came out that way.' But most cases of parascriptive learning are invisible. We learn one has occurred in each case in which we realize that finding something we learned in school to be false produces no more reaction of surprise than finding something we learned in school to be true.

To the extent that school learning is parascriptive, critical thinking is unnecessary and unlikely. Critical thinking is valuable to evaluate competing claims in the search for truth. It isn't much use in the search for the right answer.

Parascription requires no committment. Parascriptive sentences in different works don't conflict. If Sophocles's Antigone sees her duty to bury her brother as her duty to the gods, while Anouil's Antigone sees it as her duty to her brother, that just shows that Anouil and Sophocles had different artistic visions. There is no question of whether Antigone is *really* motivated by respect for the laws of the gods or *really* motivated by respect for her brother.

Similarly, if in Miss MacLean's English class the world is populated by ghosts that speak to the living, disembodied spirits and 'old souls' who've been reincarnated many times, but in Mr. Sherman's Biology class mental phenomena are reducible to the electrochemical activity of the brain and are impossible except as activity in a physical brain, well, English and biology have different artistic visions. The curriculum is an assemblage of subjects, each with its own vision. The student who attempts to construct a coherent view of the world from this assemblage does so at the peril of coming to answers that have to be wrong in one of any pair of classes.

The student can decide to suspend judgment in all these cases. But, while the ability to suspend judgment when there isn't enough evidence is valuable, in the case of school learning suspended judgment is indistinguishable from cynicism. For, even if you suspend judgement, you still must pretend to believe, to give the right answer, to get the grade, to get on with your life.

The teaching of critical thinking is affected in exactly the same way as the teaching of any other subject. If taught as a separate course, critical thinking becomes the way to get the answer in critical thinking class. If taught as part of an existing subject, critical thinking becomes an aspect of that subject's method, of that subject's "vision." At one of the round-table discussions conducted during the conference one instructor reported being asked by students whether it would be 'all right' to use things learned in critical thinking class in doing a composition for English class.

We hope that through the study of critical thinking in school students will become competent self-sufficient adults who utilize the tools and attitudes of critical thinking to rationally lead their own lives. With William Graham Sumner, we hope that,

> Men educated in it cannot be stampeded by stump orators and are never deceived by dithyrambic oratory. They are slow to believe. They can hold things as possible or probable in all degrees, without certainty and without pain. They can wait for evidence and weigh evidence, uninfluenced by the emphasis ar confidence with which assertions are made on one side or the other. They can resist appeals to their dearest prejudices and all kinds of cajolery.[5]

Parascriptive schooling makes this hope unrealizable. Just as critical thinking won't transfer from one parascriptive subject to another, it won't transfer from the parascriptive school to the student's life outside of school. There simply is no reason to transfer techniques from a fictional world to the real one. That they work in a fictional world means nothing except that these were the techniques the author chose to eulogize. To apply methods that work in a school subject seen as parascriptive to real life is as sensible as raising your umbrella and expecting to fly away like Mary Poppins.

A study by Dreyfus and Jungworth found that children think differently when presented with problems in a curricular area (biology) than when presented with equivalent problems concerning the "real life" of the pupil - peer, school and family relations.

> The use of content-based explanations associated with a "correct choice" [a rejection of all the offered conclusions] was common in the LIFE test. . . If the pupil's opinion concurred with the offered conclusion, it was accepted, and if not, it was rejected. Indeed more that 55% of the content-based arguments in this test resulted in "correct choices."
>
> The picture was quite different in the BIO test, where only about 17% of the correct choices were based on content arguments. The pupils seldom used their private knowledge to reject the conclusions. . . [instead] pupils relied on irrelevant bits of information, or even invented *ad hoc* theories, clearly using them not as a basis for choice, but as a *post factum* justification of their acceptance of one of the conclusions.[6]

The situation is as bad for prescription as it is for description. As Michael Scriven noted in "Critical for Survival":

> If you want to hear the case for legalizing marijuana, you won't get it from a schoolteacher who can be fired or forever barred from promotion if he or she utters it.[7]

The school is an extension of the nursery separated from the rest of life where teachers and their political bosses control the total environment. It continues, in loco parentis, the 'education' of children raised on fairy tales.

> American communities have chosen to use the schools as repositories for certain ideals. . . Among these ideals are those moral principles which the majority of adults more or less frankly disavow for themselves but want others to practice; they are ideals for the helpless, ideals for children and teachers.[8]

School reasoning on current controversial issues normally has the same degree of open and honest examination of alternatives as a talk about abortion with your Great Aunt - Sister Mary Francis. Another difficulty is that our students' experience with many of these current controversial issues is not by being part of them but by watching those involved in them on T.V., an experience just as parascriptive as school. As John Cambas expressed it,

> Others have referred to the possibility of people "participating" in all of the lives around them through the miracle of TV. But the issue here is that the participation is *uncommitted*.[9]

What can we do to solve or ameliorate this problem? One way in which we should not expect to solve this problem is by replacing the subject matter we now teach with more "relevant" content. Parascription is not limited to some delineable domain of irrelevant content. Any sentence can be taken as parascriptive. A population which treats its newspapers and media newsprograms primarily as entertainment should be enough to convince us of this. It is not what information students get but what they do, or don't do, with that information which determines whether learning is parascriptive.

What, then, can we do to reduce inappropriate parascription in school learning? A critique of some practices to be avoided has been part of the fare of educational methodology courses since Pestalozzi. We should teach the local and concrete before we teach the arcane and theoretical.

Beyond this, however, we should ensure that students are motivated by the interest and value of the material they are studying rather than by extrinsic motivators, gold stars, grades, degrees, or flashily entertaining presentations.

In school, students are spectators and producers. As spectators they listen. John Goodlad[10] reports that in a survey of 38 schools, involving detailed observation of over 1000 classrooms, 75% of classtime was spent on instruction (talk) and that teachers out-talked their entire class of students by a ratio of three-to-one. As producers, students produce what teachers tell them to produce and are paid piece-work wages for their production - not in cash but in script. Seek ye the truth and the truth shall get you a B. Strong extrinsic motivation, as is present when the student is 'cramming' for an exam, can make parascriptive learning inevitable.

The most important thing we must do is to establish the connection in our students minds between what goes on in school and the world. Neither we nor our students should be allowed to treat a text as an authority. We must constantly test each bit of the knowledge we teach against the world and ask of our students that they do the same. And, when they do, and find the world isn't as we say it is, we must take these results seriously, not glibly evade them and go on teaching our lesson plan. Too often we skirt around the challenge as quickly as possible. Students seldom get rewarded for proving the teacher wrong.

In teaching critical thinking we must stress soundness and not limit ourselves to the study of validity alone. As John McPeck pointed out in "Stalking Beasts, but Swatting Flies,"[11] in most controversial issues proponents for each side don't restrict themselves to logical argumentation but provide massive amounts of alleged facts. McPeck's solution is to teach critical thinking only as an adjunct to specific subjects, which has as a consequence that students would become only within-subject critical thinkers. I would argue that a better solution is to ensure that critical thinking curricula include sufficient basic research skills to allow the student to gather and evaluate factual material as needed. For this the student needs a basic understanding of empirical research methods and data analysis as well as a thorough familiary with the accessing of library resources. Unless it includes the ability to research and evaluate alleged facts, critical thinking becomes inapplicable.

Also, an inability to deal with issues of soundness makes a thinker trained in the analysis of verbal arguments a sucker for conclusions of arguments disguised as discovered facts. A currently popular method of fashioning such a disguise is the computer simulation. Reports of results of this method have twice been used recently to panic informed and intelligent people. First there was the construction of a so-called 'Nuclear Winter,' a construction based on an assumption of an earth with neither winds nor seas. Then there was the prediction of a massive greenhouse effect before the end of the century, a prediction based on a calculation of atmospheric carbon contributions and deductions that left out the effect of phytoplankton, which, by becoming sediment on the bottom of the sea, annually removes ten times as much atmospheric carbon as all human burning of fossil fuels puts in.

We can make it clear to our students that a computer is a device which produces conclusions from assumptions by logical or mathematical calculations, not, like a geiger counter or oscilloscope, a device which reveals a matter of fact. But this is not enough. There will be another disguise along in a few years. Only a serious examination of alleged facts and their basis in scientific investigation will suffice. We must replace our verbally oriented, teacher directed, education with education which makes the student an investigator in the world rather than a spectator in the classroom.

Such an intensive examination of the world outside of school, however, is antithetical to the structure of the school itself. To what extent, then, can we hope to accomplish our aims within the school? There are two factors which, I believe, give us some hope.

The first factor is that students differ a great deal in their reaction to the structure of the school. For some it is overwhelming. School defines their tasks and their reactions to them. They listen and produce, doing what they are told or what they think they have been told. For others, the structure of school is an occasional inconvenience, an annoyance from time to time, as they get on with real intellectual work. They may hate Sartre, at least the way Miss MacLean teaches Sartre, but they're reading Camus on their own. They want to scrub those test tubes out and do that experiment again after school. Some students can learn well, and become critical thinkers, even in school.

The second factor is that school itself can be changed. In fact changes for the better in many aspects of school, including teaching critical thinking and making firm connections between school and reality, were made bit by bit from 1900 through the 1940's. Unfortunately most of the gains made were lost in the mass hysteria of the early 1950's. Progress then had to begin again.

Recently, the atmosphere has been very confused. Critical thinking has been espoused by colleges, state education departments and school boards. At the same time, those who would eliminate critical thinking and any connection between the school and a real world they find contrary to their superstitions have been dominating the courts and the media. Fortunately they have been soundly trounced in the courts. Creationism has been found to be without scientific foundation and condemned as an attempt to subvert the first amendment. Presenting witches as fairy tale characters rather than as a real danger lurking outside the classroom door has been declared not an effort to establish a new religion of secular humanism but activity well within the purview of the school.

But the battles in the cities, towns and villages of the nation go on every day. Critical thinking itself has become the target in Battleground, Washington and Gibson County, Indiana, where the attack has been on Robert Marzano's *Tactics for Thinking.*[12] And the media in recent years have been trumpeting the challenge of those who argue that the problems of education can be solved by forcing in, at the knowledge level or at the even lower associative recall level, masses of material they declare definitive of the 'educated person.' If we are to win these battles we most constantly put before school personnel and the public the value of schools in which students think critically, solve problems, and live in the real world.

References and Notes

1. The naturalistic fallacy was identified by David Hume in his *Treatise of Human Nature* and by G.E. Moore in *Principia Ethica.*

2. As R.M. Hare noted in *The Language of Morals.* The Claredon Press, Oxford:1952, corresponding prescriptive and descriptive sentences have some elements of meaning in common and some essential difference.

Hare named the common elements, what the corresponding sentences are both about, the phrastic. He named the essential difference, which he compared to the assertion sign in symbolic logic, the neustic. Our analysis concerns only what Hare named the neustic. Our analysis of those who accept a sentence and speakers' intentions for these actions, and this seems a correct account of the difference between a descriptive and a corresponding prescriptive sentence.

No claim is made, however, as to the correct analysis of what Hare calls the phrastic, the common content of the descriptive and prescriptive. This account of the neustic is as compatible with accounts of the phrastic based on sense (Frege), or reference (Tarski), or reference to possible worlds (Kripke), or the relation of language to thought (Fodor, Harman) as it is with accounts based on the behavior or disposition toward behavior of those who accept sentences (Ryle) or the intention of those who speak (Grice).

3. Leonard Bickman, "Environmental Attitudes and Actions," *Journal of Social Psychology, 87* (1972) 3231.

4. John Holt, *How Children Fail*, Pitman, New York: 1964

5. William Graham Sumner, *Folkways*, Ginn and Company, Boston: 1906.

6. A. Dreyfus and E. Jungworth, "Students Perception of the Logical Structure of Curricular as Compared with Everyday Context- Study of Critical Thinking Skills," *Science Education 64*, (1980) No. 3, p. 318.

7. Michael Scriven, "Critical for Survival," *National Forum 65*, No.1, (Winter, 1985) p.9.

8. Willard Waller, *The Sociology of Teaching*, Russell & Russell, New York, 1932, reissued 1961, p. 33f.

9. John Cambas, *Mass Media and the Ego-Centric Predicament/The Trivialization of Information*, Paper presented at the Annual Meeting of the Communication Association of the Pacific (Honolulu, July 30-Aug.1, 1979) ED 177641 p.8.

10. John Goodlad, *A Place Called School*, McGraw-Hill, New York: 1984.

11. John E. McPeck, "Stalking Beasts, but Swatting Flies: The Teaching of Critical Thinking," *Canadian Journal of Education*, 9 no.1, (Winter, 1984) pp. 28-44.

12. Robert J. Marzano and Daisy E. Arredono, *Tactics for Thinking-Teachers Manual*, Association for Supervision and Curriculum Development, Alexandria, Virginia, 1986. The controversy is reviewed in "New Age of Schoolbook Protest." *Phi Delta Kappan*, 7 no.1, September, 1988, pp 66-69.

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Critical Thinking and Contextualism

Donald A. Henson

I

In recent years, a number of national reports and studies critical of American education have been in agreement in citing a common deficiency in our schools: the failure to promote analytical and critical thinking (CT) skills.[1] Within higher education, some colleges and universities have responded to this concern by developing separate, specialized courses in critical thinking, often included as part of the general education or core curriculum which must be completed by all students.[2]

That such specialized courses in critical thinking are necessary or even beneficial, however, is a view which has not gone unchallenged. And the challenge has come not only from faculty in a variety of disciplines but also from some of the leading figures within the critical thinking "movement" itself. The most common basis for the attacks from these critics is the claim that CT skills are best learned within the context of specific disciplines and academic fields. Because these separate disciplines employ different languages and methodologies, the critics argue, CT skills are context-or discipline-dependent, and they are not easily transferable from one discipline to another.

This view, which I will call *contextualism*, provides the theoretical basis for many of the objections to specialized CT courses.[3] As I will be using this term, all contextualists subscribe to the following two claims: (1) such CT skills or principles as there may be are best learned within the context of specific fields of inquiry or academic disciplines; and (2) separate, specialized CT courses are either unnecessary or of limited value. What is seldom noticed, I think, is that contextualists offer a variety of reasons in support of these claims. Thus, we may identify several quite distinct arguments for contextualism, and by implication, several distinct versions or varieties of the contextualist position. In what follows, I wish to discuss several of the most common varieties of contextualism.[4] And in each case, I hope to show that the arguments of contextualists do not support their negative conclusions about the value or necessity of CT courses in the curriculum.

II

Let's begin with a common variety of contextualism, one which admits that specialized CT courses may have marginal utility but argues that they are unnecessary on the grounds that they produce a needless duplication of effort in the curriculum.

> Naive contextualism: What students are expected to learn in specialized CT courses--viz. respect for reason, intellectual

> curiosity, a healthy skepticism with regard to authority, an appreciation of clarity and accuracy of expression, etc.--is not the exclusive province of any one course in the curriculum. In a sound curriculum, courses in all the specific disciplines should nurture these cognitive states. Hence, separate CT courses are unnecessary, since what they purport to teach may be acquired in the context of many academic fields.

If encouraging the "cognitive states" mentioned here were the sole (or even the primary) goal of CT courses, then naive contextualists would be correct in concluding that such courses are of dubious utility. This inference, however, rests upon a false premise. The problem with naive contextualism is that it fails to distinguish between the cultivation of certain CT *attitudes* or *dispositions* (correctly seen as the responsibility of all the disciplines) and CT *skills* and abilities. Developing generic skills of reasoning and evaluation is the primary purpose of such courses, in a way in which these skills cannot receive primary attention in the specific disciplines.

In referring to this variety of contextualism as naive, I do not mean to suggest that it is inappropriate for CT courses to nurture the inclinations, attitudes, and habits of mind characteristic of thoughtful, reflective persons. Indeed, something has gone wrong if a student becomes skilled in the evaluation of argumentative strategies and techniques, and yet distrusts reason as a tool for sound and deliberative judgment.[5] But it is naive in the first place to confuse skills with attitudes. And in the second place, it is naive to think that desirable CT attitudes or dispositions may be sustained (or develop at all) in the absence of any concrete skills or understanding of how rational assessment of claims and arguments actually takes place.

III

A more extreme version of contextualism may be constructed by denying the existence of any general reasoning skills whatsoever. On this view, separate CT courses are neither necessary nor beneficial.

> Ruthless contextualism: There are no general critical thinking skills. Standards of evidence for the evaluation of claims, as well as rules of inference and reasoning, are entirely indigenous to the separate disciplines, whose methodological principles alone dictate what is reasonable, well-founded, true, etc.

The inference made by ruthless contextualists seems to me unassailable. For if there are no trans-disciplinary standards of reasoning and evaluation, then specialized CT courses are not only unnecessary but also potentially harmful, since they purport to teach what (on this view) does not exist. But does ruthless contextualism proceed from an acceptable premise? What leads such contextualists to believe that standards of evidence and truth are entirely determined by the context of the disciplines in which they occur? Let's examine three possible answers to this question.

(1) Sometimes it is alleged that each academic discipline defines a range of problems and issues deemed important by its practitioners. Such problems have emerged through the history of the discipline, have been addressed by a canon of important texts and thinkers, and are couched or "embedded" in language or terminology deemed appropriate to their discussion.

I find nothing objectionable in these observations; but they provide no basis whatsoever for the claim made by ruthless contextualists that there are no universal or generic standards of evaluation and argumentation which apply to all disciplines. What does follow is that when students are introduced to an academic field, there is a necessary process of disciplinary "acculturation" which must take place. After all, psychologists may be interested in a different range of problems and issues concerning, say, human behavior, than those which occupy the attention of biologists. Students need to learn what these differences are, and they need as well to learn the particular, specialized vocabulary used by psychologists and biologists. In other words, to think critically in a psychology course, it's necessary to learn something about psychology. But none of this suggests that there are different standards of evidence, truth, or rationality in these disciplines.[6] It does not suggest, for example, that the conditions for a reliable inductive generalization in one discipline are inoperative in another.

(2) Another argument in support of context-dependent thinking skills is based upon the claim that thinking (critically or otherwise) is always thinking *about something*. One cannot *think*, so this argument goes, about nothing at all. From this conceptual truth, contextualists conclude that there is an intimate connection between thinking and the special fields of knowledge and inquiry.

> Thinking...is logically connected to an X. Since this fundamental point is easy to grasp, it is surprising that critical thinking should have become reified into a curriculum subject and the teaching of it an area of expertise of its own.... In isolation from a particular subject, the phrase 'critical thinking' neither refers to nor denotes any particular skill. It follows from this that it makes no sense to talk about critical thinking as a distinct subject.[7]

This argument is seriously flawed. First, it is false that CT courses do not develop argumentative and evaluative skills and principles through the use of claims and arguments drawn from the subject matter of particular disciplines.[8] Second, the fact that a *particular* claim (X) is under consideration does not preclude the employment of generic standards of clarity, acceptability, consistency, and the like, in its evaluation. We may illustrate this point by constructing a refutation by logical analogy. All composition or writing is writing about some particular X. One cannot write about nothing at all. But from this it does not follow that we cannot teach general principles of composition, syntax, and style. And no one should find it odd that composition has "become reified into a curricular subject."[9]

(3) Sometimes ruthless contextualists seem to be suggesting that the specialized disciplines and sciences explore different levels or "dimensions" of reality. And they sometimes suggest that the practitioners in these fields possess special types of cognition or "modes of knowledge" which those unschooled in the disciplines do not have. Historians, it is said, perceive "a different world" than the one seen by economists or physicists. Hence, they argue, what counts as knowledge or truth in one discipline may not satisfy the rational standards of another.

It is difficult to know what sense to make of these bizarre claims. But it does seem that the burden of proof falls upon those who would have us believe that historians possess "modes of knowledge" or cognitive capacities fundamentally different from those of psychologists or anthropologists. (A recent conference on "Critical Thinking and Context" promised to introduce participants to the latest research on "women's ways of knowing."[10]) In the absence of such proof or evidence, such claims (even if intelligible) provide no reason for accepting the position of ruthless contextualists.

IV

Another basis for contextualism derives from the observation that students who learn to think critically in one discipline are frequently unable to do so in another.

> Unfriendly contextualism: There are generic critical and reasoning skills. But they are relatively few in number, and the skills students learn in one discipline are not easily transferred to other disciplines. CT skills, then, are best learned in the

> context of each academic field, and so specialized CT courses are of marginal utility.

Since this "non-transferability" argument is encountered so frequently, it deserves careful consideration.

The claim that creditable performance in one field is not easily "transferred" to other fields is an empirical claim, and as such we might well expect contextualists to cite studies or empirical research which would tend to confirm it. Instead, unfriendly contextualists usually advance this claim as if it were an obvious truism and then proceed to draw their "unfriendly" conclusions.[11] (Is it true that students who excel in economics are mystified in their history courses? Are outstanding students in mathematics befuddled by philosophy?)

Nonetheless, there is something about this claim which seems plausible. What that is, however, does nothing to support contextualism. The premise of this "non-transferability" argument, I think, conceals an important ambiguity: read one way, the premise is false; read another way, the premise, although perhaps true, provides insufficient grounds for the unfriendly conclusion which contextualists draw. The ambiguity is concealed in the following claim:

> (N) CT skills which are learned in one discipline are not easily transferred to other disciplines.

One way of understanding (N) takes us back to ruthless contextualism:

> (N1) The CT principles and skills which apply in one discipline do not (necessarily) apply (are not transferable) to other disciplines.

And as we have seen, ruthless contextualists have given us little reason to think that there are no trans-disciplinary standards of evaluation and rationality, that every discipline defines its own criteria of knowledge and truth. If (N1) is the basis for unfriendly contextualism, then the argument rests upon a false premise (or one which we have found no reason to accept).

But there is another way of reading (N), and this accounts for the ambiguity in (and the initial plausibility of) this variety of contextualism:

> (N2) When students first learn to use CT skills only in the context of a particular discipline, they often experience difficulty in seeing how those skills are used in (*transferred* to) other disciplines.

Here we have a reading of the non-transferability claim which I believe has some merit. And it isn't difficult to supply an explanation for (N2).

Since the primary focus of the various academic disciplines is their particular content or subject matter, the teaching of general reasoning and evaluative skills is necessarily of secondary importance in these courses. Although students may be required to employ such skills, the learning or acquisition of them may be incomplete, and the understanding or comprehension of them may well be imperfect. The specific content of the discipline, in effect, often obscures the *general* nature and applicability of the CT principles or skills employed. In a chemistry course, for example, students learn procedures for discovering or identifying "unknown" substances and compounds: "If my unknown solution is an acid, then the litmus would have turned red. Since that didn't happen, I can rule out further testing for acids." The procedure in this illustration rests upon a very simple form of logical inference. And yet this same student who encounters *modus tollens* in an historical thesis or a philosophical essay may well fail to employ the skill she "learned" in her chemistry course. In other words, the special disciplines and sciences are a poor curricular vehicle for first teaching general CT skills.[12]

But now if this is what the claims about non-transferability amount to, it should be clear once again that we have no reason for drawing the unfriendly conclusions of some contextualists. On the contrary, (N2) would seem to provide a basis for arguing that CT courses might be extremely beneficial, in the same way that basic courses in composition and mathematics serve to introduce skills and knowledge which may later be employed "across the curriculum."

V

Let's conclude with a brief look at yet another version of contextualism:

> Pragmatic contextualism: There are so many skills, techniques, and concepts which must be introduced in a typical CT course that it is unreasonable, given the constraints of a single course, to expect students to master them all and apply them well in other fields of inquiry. A single course in the curriculum cannot teach students how to think critically. Hence, if these skills are not encouraged and reinforced throughout the curriculum--in the context of the special disciplines-- then a single, separate CT course is of questionable value.

Here we have a version of contextualism which, although flawed, is nonetheless instructive. The argument here fails because it requires a suppressed premise stating that the skills acquired in CT courses will in fact not be reinforced or encouraged elsewhere in the curriculum. There are two points which should be made here. The first is that even on their own, students are often able to see how to apply CT skills both in their study of other academic disciplines and in their everyday lives. But secondly, we must make an important concession to pragmatic contextualists. To the extent that an entire curriculum does nothing in the way of encouraging the recognition and application of such basic reasoning and evaluative skills, the effectiveness of a single course in critical thinking may be limited. In the same way, a curriculum which requires all students to complete a course in basic composition, but never again expects that they should do any writing, is fundamentally flawed. Hence, it is imperative that CT instructors work with faculty in the special disciplines to determine both which skills are most useful and which skills require reinforcement and nurturing in these diverse fields of inquiry. Without such reinforcement, the value of a single course in critical thinking is severely diminished.

VI

If my objections to these versions of contextualism are correct, are we entitled to conclude that the contextualist position is false? The answer, of course, is *no*, since there may well be other (more cogent) versions of contextualism based upon arguments and evidence we have not considered. And what is more, there may well be objections to specialized CT courses which do not proceed from claims about context-dependent standards of knowledge or truth.

In the absence of such arguments, however, it does seem that we have grounds for being suspicious of the contextualist challenge to CT courses. And in particular, I would argue, instructors of such courses should have no reason to fear that the analytical and critical skills which they encourage might not be singularly efficacious in enhancing learning in the special sciences and disciplines, especially when CT courses are integrated into the general education requirements in the curriculum.

Notes

1. See, for example, *Integrity in the College Curriculum: A Report to the Academic Community*, Association of American Colleges, February, 1985; *Academic Preparation for College: What Students Need to Know and Be Able to Do*, The College Board/Educational Equity Project, May, 1983; *College: A Report on Undergraduate Education in America*, Ernest L. Boyer, Harper and Row, 1986; and *A Nation at Risk: The Imperative for Education Reform*, National Commission on Excellence in Education, U.S. Department of Eucation, April, 1983.

2. In what follows, I will presuppose that readers are familiar with the content or typical syllabus of such courses. For those who are not, see Ludwig Schlecht's excellent "Critical Thinking Courses: Their Value and Limitations," *Teaching Philosophy*, forthcoming.

3. One writer has suggested the term "separatism" to refer to this view, since its advocates constitute a deviation from the mainstream thinking about CT courses (Albert Hayward, review of Chet Meyers, Teaching Students to Think Critically, in *Teaching Philosophy*, December, 1987). But

since this group is opposed to separate CT courses, the term "contextualism" may be less confusing as well as more descriptive.

4. My concern here will not be to identify particular authors with particular versions of contextualism (although in some cases the identifications will be obvious). Indeed, it may well be that some authors subscribe to more than one version of contextualism. But what is important is to see that the contextualist conclusions I have identified may be defended in a variety of ways.

5. A common failure of more traditional courses in informal logic is that, by emphasizing fallacies and mistakes in reasoning, students tend to think that argumentation and reasoning inevitably go awry and never lead us to the truth.

6. To think otherwise seems to me as silly as claiming that, since Journal A requires papers to follow the MLA Style Sheet, while Journal B prefers the Chicago Manual of Style, these journals encourage different standards of truth or rationality.

7. John E. McPeck, *Critical Thinking and Education* (New York: St. Martin's Press, 1981) pp. 4-5.

8. In fact, it is a distinctive feature of CT courses that exercise materials are drawn heavily from claims and arugments in their "natural habitat," as opposed to the often artificial exercises found in traditional logic texts.

9. It is ironic to note that this very same error is made by some who argue that general composition courses are worthless, and that writing can only be taught within the disciplines or "across the curriculum."

10. "Critical Thinking and Context: Intellectual Development and Interpretive Communities," conference at the University of Chicago, November 15-18, 1987.

11. "There is...no reason to believe that a person who thinks critically in one area will be able to do so in another. The transfer of training skills cannot be assumed of critical thinking but must be established in each case by empirical tests." McPeck, p. 7.

12. Another explanation for the plausibility of (N2) may have something to do with the requisite process of disciplinary "acculturation" mentioned earlier.

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Theories of Justice
or
Why I Quit Teaching Critical Thinking

Ivor Kraft

Some years back when I started teaching one of a number of required general education courses on critical thinking in the philosophy department of my university I began on day one by explaining why I thought the course content was good and useful. It will help us to think more clearly and cleanly about some of the deepest issues of our day, I assured the students. And who can deny that those deep issues require critical and fearless thought? I told the students that what I had in mind were topics such as the arms race, the meaning of democracy, the search for justice in a strife-ridden world.

At this point a student boldly interrupted to pose one of those questions that teachers both delight and dread to hear. In a loud voice the student asked, "What is justice?"

My exact response I no longer remember, but the gist of it I know by heart, having expressed it so often in my other courses on law and social welfare. My canned and pat response was along the lines that justice was the ideal of ultimate fairness in relations between human beings. Thus justice was the chief objective of law, and it was at the root of all moral systems, and it was the major concern of politics, that is, in the noblest sense of the word politics.

But the student wasn't satisfied. "You said relations between human beings," she challenged me in her loud voice. "Why human beings? Doesn't justice have anything to do with trees and rivers and the environment?" Oh yes, I responded, sure it does, but eventually it all does have to get connected up with relations between human beings. If there were no human beings on earth, there would be no need for justice or theories of justice. There was a satisfying we-hear-you hush in the classroom. But not for long. Declared my sceptical student in an even louder voice: "No human beings: perfect solution." Appreciative laughter in the classroom. On the unjust but time-tested theory that when you can't lick them you join them, I also laughed.

Yes I laughed, but not comfortably. And for a number of semesters, as I was teaching my course on critical thinking, the question echoed in my mind and bothered me. I all but abandoned any "justification" pitch for the course. I left out any mention of justice. How critically had I ever thought about justice, and what special skills did I have to make me even a minor justice-expert? Here I was within shouting distance of retirement, with my well-aged Johns Hopkins Ph.D. and my nearly inactive membership in the bar of California and my fading local reputation of being a pretty sharp and logical thinker; but did I know even two solid gram's worth about justice, in theory or in practice?

Last summer (1987) I decided to give the matter some thought. About time. But how to begin? Certainly not by boning up on the fine points of fallacy detection, or by giving myself advanced refresher courses in math or symbolic logic. No, the best way was to go back and read or re-read what the wisest minds had to say on the subject, to reflect on what I was reading, to relate it to my own experience and my knowledge of the world that I knew best, the American world in which I was now living in this bloodiest of centuries, and to which in the foreseeable future I would be making my hail and farewell.

Have no fear, not being a trained philosopher, it would hardly be proper to bore you with the details of what I read and how I reflected. But I will say that I spent some stimulating hours and months with Plato, Aristotle, Spinoza, Marx, Dewey, Russell, and a few others.

As everyone quickly learns after even a week or so of study about justice, all the meanings of the concept and all the debates about it boil down to a quite simple set of two ideas. The first is the "meting out" idea: we have a given system of laws or mores or customs in a culture, reducible to do's and don'ts, and justice is what gets dispensed, "meted out," when someone violates the rules and regulations. It can get quite complicated when the do's and don'ts are obscure or in conflict, as every lawyer knows. Richard Nixon, Oliver North, and Edwin Meese III--himself Mister Justice Numero Uno in the culture--are just a few of the recent cases that present us with meting-out problems.

The second idea of justice is generally thought to be the grander one: what is the ideal and ultimate set of rules and regulations, stripped to fundamental principles, that will enable human beings to live worthy, good, and nearest-to-perfect lives on earth? Fundamentalist Moslems have no trouble formulating this super-grand idea of justice as Allah's will for man, and formulating it as God's inerrant plan for man. But most of the rest of us have big problems in the justice-writ-large department.

I'm not going to say anything about the specific substantive and procedural ways of meting out justice in thousands upon thousands of cases that pop up in a culture. One good way of keeping up with this is to read the summaries of Supreme Court cases that appear regularly in the *New York Times*. Does meting-out justice require that your local police officer must obtain a search warrant before picking through the garbage that you place on the curb beside your home? No, it doesn't. You don't have a "privacy expectation" in your garbage. Does our kind of meting-out justice require that large all-male clubs, even when they claim to be "private," require them to admit women whether they want to or not, or else be guilty of unfair sex discrimination which is in violation of our Constitution? Yes, it does require them to admit women. Can you prevent a theater owner from showing a film because it's pornographic? That will depend not on the film, but whether you're in Las Vegas, Nevada or Americus, Georgia. And so forth and so on.

It wasn't justice writ small, it was big-time justice, justice universalized, justice as cardinal virtue, justice as the idea of a guideline or mainline of the Supremely Correct that would underwrite humankind's proper conduct with regard to cosmic dignity--that was the kind of justice I was trying to learn about in my summer reading. I'll give the show away right here by saying that concerning this idea of big justice I learned nothing worth reporting. I swam in an ocean of abstractions, but I learned nothing. I could have spent my summer mastering beginner's auto repair work.

Even though I didn't learn anything worth mentioning, about this justice, I did learn things about how thinkers get on with thinking about justice. For example, if you are going to fashion a grand theory of justice, and you want to put it on a really solid foundation, then it will certainly dress up your theory to have an answer to the following question: What is the ultimate meaning and purpose of human life on earth?

No doubt about it, it will surely get you one big jump ahead if you know something about the ultimate M and P of human life. Justice really ought to be in conformity with that ultimate M and P. Curiously, one short answer is: none. This is a suitable answer for an austere and lawyerly mind, a mind that never goes "beyond the evidence." Since our present development as a species on this earth is such that we can give no meaning to this question--we don't even know just what life is or why it should be--for the time being we can know absolutely nothing about such purpose or meaning. We lack evidence. Thus "none" is the only honest answer.

To be sure, you can practice lordly denial. Theoreticians of justice are known to do this. You don't have to deal with this M and P question at all, not even answering with our "none." You can end-run the query. You can plunge in saying that whatever may or may not be the ultimates of human existence (we're here because we're here because we're here) billions of individuals do insist on living out their lives in an "as if" state, in a state of believing that they are living their lives in just ways. And here is my conception of what is a proper or fair or harmonious way for them to do so. Please be good enough to accept my plan as a theoretical scheme for justice, for living justly. Justice has obviously (obviously?) got something to do with fairness and harmony and proper relationships among human beings in the here and now as well as the foreseeable future, so why do we have to be all that much concerned about the ultimate M and P?

That sounds reasonable enough, although you do leave yourself vulnerable to one constant and merciless line of attack. Anyone who is in possession of a clear and convincing belief about the ultimate M and P, a belief rooted in matters which are not apparent in the "here and now and foreseeable future" aspect of things, will attack and then dismiss your theory as irrelevant.

Here is an example. John has just come up with a pretty sophisticated theory of justice, premised on such notions as human equality, freedom, non-violence, the primacy of individual dignity, conservation of the earth's resources for the welfare of posterity, and maximum realization of something called "human potential." In its own terms it does seem to make a lot of sense, and if John's theory were implemented, it does seem to suggest that the world would be a better place to live in for most of its *hic et nunc* (John had Latin in high school) inhabitants than the world here and now is.

Nevertheless, Mary states that John's *hic et nunc* theory is no good. How can she get away with such a blunt verdict? Well, Mary happens to be absolutely convinced that the ultimate fact about human life is whether or not individual souls achieve eternal salvation after death with a certain god in eternity. Mary's theory is pure *ibi et tunc*. No course on critical thinking could possibly challenge Mary's deep faith in her theory. Little schemes of reason and logic have their place, oh yes, says Mary, but how can they touch the deepest recesses of the faithful heart? The heart has its reasons which reason knows not of and more in that vein.

Mary says that a theory of earthly justice such as John's with no mention of eternal salvation, is not worth the paper on which it's written, for it is the very incarnation of injustice, actually evil, to make people think that worldly arrangements treating of such transient and changeable states as equality, privacy, or creative intelligence can somehow bring souls to salvation. Who can argue with Mary's viewpoint, given her higher and more comprehensive ultimates-theory, derived from faith at unfathomable depth?

Well, Edna can. Edna is a super-*ibi-et-tunc*-ist. Edna is quite convinced that the ultimate meaning of reality has little if anything to do with the everyday physical world that presents itself to our senses. Edna has come to know that the cosmos perceivable to the ordinary human intelligence is merely a pale reflection of certain eternal forces which lie in fact behind and beyond the cosmos. These forces are termed Perfect Essences, and there are four of them: the True, the Beautiful, the Good, and the Just. And they are co-equal. (Yes, we all know that Plato regarded Justice as the supremest virtue, in a class by itself, but this isn't Plato, this is Edna.) The four Perfect Essences, in a way simply not comprehensible to the human mind as mind, unite into a kind of super Essence, which for want of a better word, Edna simply calls the Perfect Oneness or Holy Unity, which is more than god, more than reality, more than existence itself. Confusing? Well, never mind. It is totally out of the range of the human mind--it is a kind of all-in-all, and we can get only impure glimmerings of it when we attain to certain mystical states.

Still, Edna believes that human arrangements on earth are important, for the sensory experiences and human relationships are a pathway to achieving comprehension of the Perfect Essences. So a true theory of justice or the just is essential. Edna's working on it. For five years she has been writing a book which she will call *The Public Thing*. Edna's grand theme is going to be " a place for every person, and every person in her place." (And when it's published, if that doesn't get Edna her full professorship, nothing will.)

What does Edna think of John's theory? She regards it as trivial, rather childish. The just society on earth must be one under the command and control of the wisest and best human beings, a very small and select group who by dint of extra-ordinary effort and study and gruelling experience have actually transcended most of their sensory experience to gain some identity in spirit with the Perfect Essences. Edna hopes one day to join this select company, and the last thing she thinks she needs to attain her ambition is a compulsory general education course on critical thinking. Such a course will in no way persuade Edna that she needs to be more empirical and less metempirical in her approach to justice.

Edna is convinced that the select and wise few will know how to run the world so that each human being is assigned her proper role in the scheme of things, in conformity with the True, the Beautiful, the Good, and the Just. For Edna, a notion as crude as that of human equality is fallacious in the extreme and defeats the very purpose of justice. To say that a person whose life is reflective of greed, selfishness, envy, hatred, and a tolerance of falsehood and ugliness and evil is somehow equal to a person whose life is motivated and disciplined by the highest goals of what is just, beautiful, and good--well, that is to defeat any possibility of the good society on earth. And to the extent that John's equality yields democracy, which John passionately advocates, then such a democracy is downright evil. Edna has no trouble in whipping up a positive fury of examples to show John how American democracy, for example, has yielded racism, sexism, the horrors of poverty, millions of wasted and empty lives, crudities and abominations of popular taste of which child pornography is merely one, to say nothing of that ultimate horror of horrors, the stockpiling and apparent willingness to use thermonuclear and biological weapons which may end up destroying all human life on the planet. Yes, Edna insists, these are true and germane products of John's simple-minded equality and democracy, so essential to his theory of justice. It is very doubtful whether John will ever bring Edna around to accepting his *hic et nunc* theory.

We may as well wind up by bringing George into the picture. George is certain that the only and ultimate meaning for human life is a process of evolutionary survival through constant expansion of the creative capacities of our species. Thus, justice must promote "survival with growth" for our time and all time. George is further certain that our survival now requires a planned, orderly distribution of the world's resources. This cannot be achieved under the present political and economic arrangements. Only a deliberate struggle rapidly to reconstruct the world political order under the leadership of dedicated activists--George prefers not to call them "revolutionaries"--and to dismantle imperialistic and exploitative structures whether of the USA or USSR variety will in our day promote the ends of justice.

A theory of justice must be rooted in history, says George. It must build on the lessons of history. George does not quarrel with some of John's concepts of freedom and equality, but he dismisses John's theory as weak, naive, and flawed because it makes no provision for a political program and historical progress. John's is a theory without process, and process is all. George says that John's theory is merely out of date liberalism, a kind of let's muddle-through-ism. It's a blend of crude environmentalism and formalisitc, toothless democracy which only promises pie in the sky and thus deceives the masses by emasculating the activist struggle.

If you suggested to George that he might sharpen up his views by taking a course in critical thinking or informal logic, George would laugh in your face and explain that courses in critical thinking are make-work for professors of philosophy whose chief function is to brainwash students into ignoring or condemning the activist struggle because the contemplative life is nobler. As if now and then pointing out a logical fallacy in a politican's speech or a newspaper editorial is going to have any impact on building a more just society. George will also take the grim satisfaction in telling you that courses in logic were highly popular in the German universities under the Nazis.

Now suppose John answers all three by simply going back to square one, by adopting the strategy of denying the validity of the question. Ultimate meaning and purpose of human life as a preliminary to laying down a grand guideline for living? The question itself is meaningless. There is no way that a form of life can know anything ultimate about itself. In other words, for all practical purposes, there is no ultimate or final or everlasting meaning for the reality of human life, no M and P. I can live with that, says John. Why can't you?

But John may be facing a different trap. If there is no possibility of knowing about the ultimates, then why do we need a theory of justice? Why, horror of horrors, do we even need justice without a theory? A theory means that you are dealing with certain fixed and final concepts, certain ultimate guideposts. Sure, you can have change and growth and variance built into your theory, but even so, and even if one day your theory gets overthrown and replaced by a better one, you have to have some fixed guideposts regulating the process of change. If there is no certainty in the end, there can be no intermediate certainties carrying us along towards that end. Isaac Newton's theory, for example, had a fixed and final force, gravity, and it was precisely this force which made Newton's theory a theory. When Einstein came up with his relativity concept, that seemed to take us beyond Newton's gravity, and to that extent we had a new and more advanced theory. But we don't study Newton and Einstein to learn about human justice. Edna seems to have something like this in her Perfect Oneness. Mary certainly has it in her theory of eternal salvation of the soul. Even George might claim to have something similar in his evolutionary survival through growth, although it may appear a bit vague when you peer at it closely.

But John does not seem to have anything like this. At the most his approach only entitles him to come up with some practical suggestions--do this, don't do that; try such-and-such; pass one kind of law and avoid another; suppress that kind of behavior, but support this kind of behavior--in the hopes that they will work and yield more fairness and harmony in today's world. Yet someone else could come along--a Tom, Dick, or Jerry Falwell--and suggest quite opposite solutions and behavior bits for building the just society. We don't need more equality, we need more inequality. One-man-one-vote democracy isn't part of the solution, it's part of the problem. Reason will get you only so far, it's prayer that truly counts. The arms race keeps us strong and on top and is actually good for us, not bad for us. The world doesn't need more women growing up wanting to become lawyers, physicians, and scientists so as to make them less "marginalized" and more vulgarly "equal" to men; it needs more women growing up wanting to become loving and better mothers and wives, for they will end up creating far more justice on earth than all those lawyers and scientists. You can join Tom, Dick, and Jerry in adding more such contra-items to this listing.

Some might argue that John shouldn't pretend that his bundle of ad hoc suggestions amounts to a theory of justice or even an objective, rational, critically thought out program of justice. Indeed, he should be against the whole notion of such a thing, for it will do more harm than good by getting us sidetracked and even confused with abstractions and mental gymnastics. John has got his hands full defending his value judgements. He should concentrate on coming up with the best practical suggestion he can, ones that are historically and psychologically acceptable in his culture. He should refuse to make grand theories about them. He should be a pragmatist and a "program-ist" and not a justice-theorist.

Does John need a generic, a one-size-fits-all course on critical thinking? We've already seen that Edna, Mary, and George have absolutely no interest in being coerced into taking a general education critical thinking course. Maybe John should not be coerced either. Possibly John's best strategy is to spend his time gathering in-context solid evidence and data to formulate and defend his improvement-of-life program, piece by piece. He will learn to think critically *ambulando*, as he goes along.

Probably you've figured out for yourself and you don't have to be told at this point that my reflections on justice caused me to conclude that it was time for me to quit teaching critical thinking. When I told my students that a required course on critical thinking would significantly improve their ability to understand the nature of democracy and justice (among other things), I was committing the worst professional crime: I was speaking untruth. To be sure, I did so out of innocence, but then innocence is no excuse, especially when you've got white hair on your head and over 60 years on your back and a bellyful of not-so-innocent encounters with the harsh realities of daily life in our great American land.

So how could I continue merrily along my way, just because I happened to get a kick out of it as a teacher, pretending that doing a few textbook excercises on generalization and definition and causation, plus some tidbits about slippery slope fallacy and non sequiter-and with a spot maybe of *modus ponens* and *modus tollens* tossed in, that all this would somehow add up to a useful preliminary mental infrastructure for launching into a study of justice on earth--well, it simply made no sense at all.

And it wouldn't even have made sense for Aristotle. Equals must be treated equally and unequals need to be treated unequally, said Aristotle with ample logic, but that great master just *knew*, he knew in his gut, that slaves were slaves by nature and women were inferior by nature, and certainly did not have to be treated equally like free men.

Suppose when that loud-mouthed student had asked "What's justice" I had answered "I don't know, but let's talk about it since it's a fascinating topic, and those of you who aren't interested can go do something else." Very well. Those students would not have been "exposed to" Venn diagrams and *modus ponens* and truth tables and *argumentum ad invidiam* and *argumentum ad misericordiam.* And probably seven-eighths of the students, no longer taking critical thinking under coercion, would have walked out of the classroom to do something else. But since nine in ten of them were majoring in business, engineering, criminal justice, and other vocations, I expect that they were picking up some tricks of their respective trades not all that different from tabular and circular modellings of truth, such as truth may be.

But it has just dawned on me as I sit here writing this that I have never in my life made up my mind about such important issues as the arms race, apartheid in South Africa, a woman's right to have an abortion, or whether impoverished children ought to have a constitutional right to free bus transportation to and from school, or whether I'm entitled under the Fourth Amendment to a privacy expectation in my garbage, by the way of truth tables or Venn diagrams or avoidance of *argumentum a misericordiam.* And here we've just spent a relaxed class period discussing justice, and I haven't seen fit to lay as much as a solitary Venn diagram on you.

Still--do you feel you've been victimized by a rather long drawn out and sneaky *argumentum ad misericordiam*? I'm not sure. Maybe we should talk about that.

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II.

Papers on Critical Thinking and Educational Practice

The first section of these proceedings present papers that are primarily theoretical, although many of the writers draw implications for instruction. In this second section, papers with a primary focus on critical thinking in the context of instruction at the collegiate level are presented. These writers highlight the practical aspects of teaching for critical thinking, reflecting on the theoretical roots of such practice as well, primarily within the academic disciplines. The four sets of papers present, in order, a) general reflections on the nature of the college experience, b) discipline-based academic tasks designed to involve students in critical thinking activities, c) critical thinking in its relationship with language, and d) pedagogical approaches to critical thinking in the context of language learning, with an emphasis on writing.

Critical Thinking and Collegiate Pedagogy

The papers included in this section, by Edward Cook, Robert Forman, Michael Kagan, Carol Huber, and Richard Porton involve general reflections on the nature of college experience and critical thinking within it.

Edward Cook, in *Teaching Critical Thinking: Seeing Connections*, focuses on "asking questions" as the essential aspect of critical thinking: "what constitutes a 'good' question and which criteria should be used to answer it is of the greatest importance in the learning process." Cook reviews Perry's model of college student development, and considers the role of critical thinking in guiding students through the developmental journey from dualism through multiplicity and relativism/contextualism toward commitment.

Robert Forman's paper, *Socrates and the Unresponsive Student*, cites Augustine's demand, following Plato, that "anything worthy of being learned has some higher referent, something beyond itself." Too often, Forman notes, "courses of instruction become a mass of material learned in isolation... it is an open and perhaps moot question whether any system of mass education can produce a body of individuals for whom inquiry and critical thinking constitute the essential process of knowing." Forman recommends that every class lesson force some sort of critical response from students. Art, music, poetry may be introduced in the context of seemingly unrelated subject matter for this purpose; dialectical discussion, and other techniques can be used. Forman suggests that teaching for critical thinking "implies more than simply asking questions; rather, it must make student inquiry unavoidable."

Michael Kagan writes about the analogies between verbal and non-verbal self-defense, in *Critical Thinking and Logical Self-Defense: Meeting the Language of Argumentation with Sensitivity.* He uses the martial arts to draw parallels between these two forms of defense, and highlights the combative nature of argument and debate. His emphasis, within this framework, however, is on sensitivity and concern for others' points of view, asking us to reconceptualize the traditional understanding of verbal disputation as a martial art to include the realization "that not all martial arts are confrontational (in meeting force with force) and that many emphasize gentleness, sensitivity, and compassion." This involves a characterization of a fallacy as often involving "a maneuver based on an awareness of one's opponents' basic strategies" and a focus on the "implicit in persuasive exchanges."

In *Toward a More Commodious Academic Discourse,* Carol Huber also discusses "adversarial discourse," with its thesis-driven argument, as the primary but unquestioned form of academic discourse. Such discourse is combative in nature, designed to claim domination for one's intellectual authority and to win arguments over those of one's real, or imagined, opponents. "Alternative, more dialogic, constructive, discourse forms, less alienating to females, deserve more attention from educators seeking to foster critical thinking," she suggests.

Richard Porton, writing in *Dialogical Teaching and Popular Culture*, considers the role of mass culture and critical consciousness. Is popular culture a "commodified wasteland"? Can Friere's conception of "dialogic teaching" be used to wean students from "the allure of "spectatorism"? Porton suggests that students be helped to analyze critically these "artifacts of daily life" in a manner that promotes their own self-liberation, and cites Giroux, "culture must be analyzed as something that students can construct and appropriate as agents who can engage in the task of social and political reconstruction."

Teaching Critical Thinking: Seeing Connections

Edward M. Cook

Echoing Arnold B. Arons' comment that "no curricular recommendation, reform, or proposed structure has ever been made without some obeisance to the generic term "critical thinking" or one of its synonyms..." I shall attempt to "unpack" the term "critical thinking," settling for what I consider its common denominator, be it a matter of strictly logical thought or creative imagination, viz., asking questions and seeing connections. In so doing, I shall use as a primary model William Perry's developmental theory along with what I consider important refocusing in terms of "connected learning."

Let me begin by explicating the metaphor used by Elaine Maimon - "sketching the landscape" - as her alternative approach to what have been called respectively the "scalar" approach to learning and entering into different "language communities and/or cultures." The scalar approach views learning as a kind of climbing a ladder whose rungs progressively challenge the student's interests and abilities: in this approach, each stage in the learning process builds upon the other and essentially implicates its concepts and language. Contrasted with this scalar view is that of learning as entrance into various and often disparate interpretive/ language cultures. Each of these cultures has a conceptual framework and language usage peculiar to its own disciplinary/professional objectives and methods. In the scalar approach, the student is not seen to be at any great disadvantage; that is, as one unfamiliar with the territory mapped out by the professionals in their respective fields and/or disciplines. Learning in this environment is comparatively less threatening and more easily evaluated. In other words, what is expected of students can be schematized in a syllabus to be followed rigorously, detailing readings, assignments, exams, etc.; thus, grades from 'A' to 'F' are more easily determined and certainly more defensible in face of student challenge or complaint. In the "interpretive/language communities approach," however, the opposite seems to be the case; that is, the student is at first lost within the respective disciplinary/professional jargons, at the mercy of each disparate group of teachers, having to learn the rubrics and subtle behaviors of each, resulting in some more arcane evaluation techniques.

Maimon's alternative as suggested by her metaphor, "sketching the landscape," offers what appears to me, at least, a more humanistic approach to the learning experience. This does not deny, however, consideration of evaluative stages nor that learners must adapt to innumerable learning communities in their quest for knowledge. Its advantage comes from viewing the instructor as a guide and/or facilitator in the educational process. This does not imply that such guides/ facilitators are not expert in their respective disciplines as to content and methodology, but that they do not view themselves as fonts of knowledge - transmitters of an acquired lore of information and critical acumen got by dint of voluminous reading, attendance at lectures, note taking, and passing those darn-awful finals. Nor do they presume their students to be its anxious recipients. No, in this view educators attempt to empower their students with a sense of worth and intellectual ability, bringing the learning process within their reach and relating it to their interests and previous learning experiences, which are not to be limited to their previous formal education.

As suggested by Maimon, the following illustration might help to clarify the thesis. Consider for the moment the nude figure. Stop to think how many different ways vis-a-vis an individual's perspectives and/or experience persons might interpret this same nude figure. To mention but a few: for the artist, the nude is an object of beauty; for the sociologist, a possible representation of antisocial behavior - eccentrism or deviance; for the moralist, nudism itself becomes the issue, prompting thoughts about censorship and potential harm to children. And so with other areas of exploration in the learning experience. What the guide/facilitator must do, is to bring each student to interpret any particular item of inquiry from his/her own vantage point without, however, considering it the only way to proceed, the only route to be traveled. In having each student share with other students, under the guidance of the facilitator, these various interpretive perspectives, the community of learners gains fresh insights into the subject under consideration and are thereby encouraged not to remain isolated in their own little intellectual domains. In this regard, as noted by Maimon, students in their earlier years probably think teachers taught different subjects - history, science, literature, etc., merely due to their parochial interests, circumstances and abilities, without understanding that these instructors had developed in their studies different systems for looking at and organizing their learning experiences. These shifting perspectives account for the different questions asked and the diverse methods employed in their teaching. So we see that helping students learn is similar to encouraging them to sketch a landscape from their own perspectives, comparing these with sketches made by other students, and where need be, correcting their interpretative vision and/or draftmanship with further shading, delineation, composition, etc.

I would now like to concentrate on the matter suggested in Maimon's observation regarding "asking questions." This, I think, is the essential aspect of "critical thinking." It has been the focal point of education from the days of Socrates, the "questionae disputatae" of the medievalists, to our own times as found in Perry and Belenky. As I see it, based on their theories, what constitutes a "good" question and which criteria should be used to answer it, is of the greatest importance in the learning process. To get a better grasp of this, let us turn specifically to Perry, who provides a working model for dealing with students at various stages of their educational journey.

For him, learners fall into four basic patterns: dualism; multiplicity; relativism/contextualism; and commitment. Dualism divides everything into the realms of good and bad, right and wrong, us and them. Right answers exist somewhere for every question and some authority must have them. Answers are to be memorized by the dint of hard work - note taking becomes a kind of phobic response. Agency is experienced as "out there" and to be translated into authority figures, test scores, and the right job. Multiplicity, on the other hand, recognizes diversity of opinion in areas where answers have not yet been obtained; but, these opinions remain atomistic without pattern or system. They admit of no correct or incorrect judgments; everyone has a right to his/her own opinion, and nothing really can be labeled "wrong." The third category, relativism, exhibits more intellectual legitimacy in that its diversity of opinions, values, and judgments are derived from coherent sources, based on evidence, reason, analysis and comparison. Some opinions might even prove worthless and about certain matters even reasonable people might disagree. In this case, knowledge is qualitative, dependent on contexts. Finally, we come to commitment: here affirmation, choice, and decisions regarding career, values, politics, and personal relationships are made in full awareness of this relativistic attitude. Agency is experienced as within the individual.

These categories are not, according to Perry, mere formalities or convenient ways of classifying learning theory: they model reality, the world wherein people actually think, learn, and interact and have been sufficiently verified in his own clinical work. I cite them as a possible framework for a hands-on approach to students. As I see them, they are ways of having students find their own voices and at the same time learn to listen to other equally important voices, both those of their peers and instructors. As suggested by Van Hecke, the key questions for Perry's respective categories center around increasing student awareness. For the dualists, questions are needed to increase awareness of their own voices: can you identify what you have learned? What led you to think that? For the multiplists, questions to increase awareness of the limitations found in their own subjective responses: what other factors might make a difference? Is taste and/or personal bias the ultimate test for determining what is best? For the relativists, questions to increase awareness of their own reasoning processes: what assumptions does your argument involve? Assume both you and your opponent are correct to some extent, what are some explanations of the differences? For the committed, questions to increase awareness of the practical implications of their beliefs in themselves down the road and in others: how do you reconcile your beliefs with those of others in a democratic/pluralistic society? Do you feel responsibility for others? To whom? And under what circumstances?

In these attempts to influence/guide the student, the instructor's role respectively is: to convince the student that "every question has an answer" approach is at best dubious, thus dispelling his/her belief that knowledge is something discovered like unearthing a buried treasure; to help students use analysis and criteria in selecting preferable ideas/ opinions despite an admitted degree of uncertainty - convincing them that each morsel of knowledge, each system wherein it is contexualized, each viewpoint has its limitations; not even experts have all the answers; finally, to show how decisions can be used to assert both personal values and analyses - thus restoring passion to the voice and engaging students in constructive knowing and the art of making connections.

Belenky elaborates on this important fourth step, noting that engagement requires: a) empathy - understanding how another can believe differently without devaluing that person; b) contextualization - answers often vary with the context and frame of reference; c) recognition of complexity - simple answers are rare; trade-offs and approximations predominate; d) enthusiasm - empowerment vs. hurdling; and e) involvement - in a highly organized society, I can and must make a difference.

Joanne Kurfiss offers sound advice, it seems to me, for the instructor helping students "sketch their landscapes" when she writes: "students who advocate subjectivism or multiplicity are ready for the challenge of a learning situation in which students and professor collaborate to explore and justify interpretations or applications of course material. They need to learn frameworks for thinking about important issues, but they also need guided practice in using them to analyze works of art or literature, evaluate assertions, consider alternatives, and examine the bases for their beliefs. These experiences stimulate development toward contextual relativism..."it is this latter, contextualizing ideas, opinions, beliefs which constitutes, I think, the *sine qua non* of all critical thinking. Indeed, faculty who encourage students to challenge their ideas communicate a strong commitment to critical thinking. Kurfiss, however, in regard to the instructor's strong commitment notes that two things must be kept in mind: male and female students learn in different ways; and the instructor must be prepared to encounter some skepticism on their part when teachers protest they want students to question. What often lies hidden is their suspicion as to whether they really want them to question the instructor's point of view? She feels that many students, especially women, have been brought up to believe it inappropriate to challenge authority or to criticize the ideas of others. My own experience tends to confirm this: students overall believe "teacher knows best" when it comes to his/her field of expertise. On the other hand, when it comes to touching upon students' instilled values, somehow they suddenly become intransigent, reminding me of the student who recently complained when the issue of "AIDS" was being discussed: "I didn't come here to have my ideas changed about such things." Another equally threatening variety of this mentality is, I think, seen in the entrepreneurial approach to education: "I'm paying good money for this course and not getting much out of it."

Not all critical thinking centers on the discursive approach to learning/teaching; there is even here a valid alternative, viz., what has been called "exploratory" thinking. In this alternative, critical thinking is not seen as a kind of sterile demonstration of a thesis, intent on proving oneself right and the other person wrong; rather, critical thinking viewed as "exploratory" learning/teaching is challenging the student to manipulate and examine an idea, to invent arguments where satisfactory ones don't exist or when alternative ones might reveal other assumptions, leading down other avenues or paths. As noted by William Zeiger in his paper, "The Exploratory Essay: Enfranchising The Spirit of Inquiry in College Composition," our modern notion of proving an assertion to win its undisputed acceptance and thus stopping inquiry rather than starting it reflects our belief in a mathematical, technical, and scientific model and/or world. I feel its perfect embodiment is found in the computer wherein human intelligence is modeled on strictly deductive and inductive lines; as though, there was no other path to enlightenment. In contrast, Zeiger writes: "...inquiry, or exploration, aims to discover the fecundity of an idea. It does not pursue a linear sequence, but holds several possibilities in suspension simultaneously, inviting the inquisitive mind to play among them...when one sets out to prove an assertion in the modern sense, one tolerates no ambiguity..." Zeiger feels that in taking the latter approach, at least exclusively, we fall into the results-oriented popular prejudice and fail in our duties as liberal educators. We are implicitly teaching that the ability to prove an assertion or deny that of an opponent is more important then the ability to examine the issue: the implicit message is, proving is more important than finding out the most appropriate answer, solution, or way of looking at the issue. Another writer, James Kinneavy, in this same vein suggests three stages in exploratory learning: I - raising questions about dogma, countering such claims with sometimes jarring anamolies and suggesting the possible crises which might result from their rigid application and/or compliance; II - searching for answers, specifying the question and examining other efforts to respond, trying out other models, developing alternative theories; III - testing the new answer, identifying a testable hypothesis and conducting research, constructing feasible arguments to confirm or deny the theory. One might recall Pirsig's caveat in his acclaimed work, *Zen and the Art of Motorcycle Maintenance* "...an experiment is never a failure solely because it fails to achieve predicted results. An experiment is a failure only when it also fails adequately to test the hypotheses in question, when the data it produces don't prove anything one way or another..."

Returning to the metaphor, "sketching the landscape" I shall attempt to discuss it as found in one of its original sources - the "philosophical thoughts" of Ludwig Wittgenstein. Wittgenstein throughout his later writings takes great pains to deconstruct, as it were, his earlier thinking about what it means to know/understand and the methods of verifying one's beliefs. In his *Tractatus Logico-Philosophicus* he attempted to solve the problems of philosophy, as posed by Bertrand Russell, by drawing sharp lines of logical demarcation between factual assertions and ethical/esthetic beliefs. What could not be said clearly, must be remanded to silence; to do otherwise would be to talk a kind of nonsense. Although he admitted even in this earlier work that his own statements should themselves be regarded as nonsensical, they might prove helpful for the forewarned to "see the world aright."

In his later period as evidenced in his *Philosophical Investigations*, Wittgenstein took a radically different view of things. Context became the issue. The important thing was to study the grammars wherein language games are played, and these as rooted in what he called "forms of life." Description, not explanation, was the way to proceed. A few "remarks" in the context of the metaphor seem quite appropriate: "...compare a concept with a style of painting...;" (*PI*, p. 230) "...the very nature of investigation compels us to travel over a wide field of thought criss-cross in every direction...;" (*PI*, IX) "...language is a labyrinth of paths. You approach from one side and know your way about; you approach the same place from another side and no longer know your way about...; (*Ibid.*, 203) and "...the remarks in this book are, as it were, a number of sketches of landscapes which were made in the course of these long and involved journeyings..." (*Ibid.*, IX).

All of this is what is called Wittgenstein's "perspicuous" view of learning, that is, his contrasting explanation with description. Explanation, he argues, rests upon a psychologistic theory of knowing wherein the mind is perceived as some nebulous phenomenon situated in the brain and understanding, etc., as internal "mental" happenings. Description, on the other hand, deals with "doing" in the context of what he calls "language games," whose interconnections must be explored if the landscape is to be properly interpreted. For him, the ultimate bases for such descriptions, which reductively are the grammatical rules governing their usage, are not as such subject to justification. People "see connections" and "make perspicuous representations" when they understand these grammars; otherwise, they "bump their heads against a stone wall." Thus one depicts arrangements in depth by moving around in many directions in order to capture the great variety of linguistic comparisons which display the vital role of this or that part of the conceptual landscape, reminiscent of his remark: "...our language can be seen as an ancient city: a maze of little streets and squares, of old and new houses, and of houses with additions from various periods, and this is surrounded by a multitude of new boroughs with straight regular streets and uniform houses..."

The landscape has many contours, some more easily definable than others. Take for example, factual claims whose truth or falsity can be verified by sensible and/or scientific observation/demonstration. But then, there are the blurred horizons of ethics, religion, and esthetics: here one must tread cautiously, anticipating overlap but always prepared to encounter difference. Possibly one best understands Wittgenstein in such instances, if one thinks of learning in terms of his conception of music, as described in a recent work, "Wittgenstein's City," by Robert J. Ackermann. He writes: "...if music is represented in a score, an understanding of music is shown, not by theoretical explanation, but ultimately by how the score is played, a process that does not require the accompaniment of conscious states...music typically does not refer to anything other than itself, and what is conveyed in music depends solely on a place in a system of harmonic and melodic sources...the score is a picture of what is to be played, but its application is not given with it as an additional statement; it is interwoven with musical culture..."

Then there is the mathematical statement, certainly different from the factual assertion but less clearly different from the aesthetic. Early in his *Philosophical Investigations* Wittgenstein provides us with a significant example: consider a slip of paper with the words "five red apples" written on it. Ask yourself, how different and/or similar each of these terms is: "five," "red," "apples." Do this by asking yourself how you learned each, how you would teach a child each? How would you use such a slip of paper to inform the corner grocer what you wanted, if he did not understand English? As with other factual claims and/or objects, "apples" can be taken care of by ostensive communication/learning - pointing to and naming apples. Whereas "five" and "red" require respectively basic knowledge of a memorized sequence of cardinal numbers for counting "five" and an ability to recognize commonly used colors, backed up by a few color samples sufficient for ascribing "red." In other words, an appropriate basis for each is included in the resources of ordinary language; but imagine, the necessary "learned" transitions needed to employ/use a more sophisticated treatment of colors and mathematical symbols: for example, if one had to mix colors to paint a landscape or to use calculus to derive a proof.

Thus for Wittgenstein, learning/understanding is not a simple process of transmitting information, teaching logical theories, or summarizing causes and effects; it is an intricate organic experience, connecting their more transcendent applications with the rudiments of language learning. As he demonstrated in his own learning/teaching career - he learned best, it is said, what he taught himself - as elementary school teacher, his pupils were guided in their learning experiences finding their expression in building simple machines, collecting and classifying artifacts and biological specimens, and in composing their own spelling book. Later as professor, he would tell his students to "look! stop thinking!"; that is, to see the connections of what lay right in front of their eyes, not allowing abstract concepts and philosophical muddlements to get in the way of seeing what is essentially clear once the debris has been removed.

I trust then some insight has been provided through this attempt at "unpacking" the expression "critical thinking," especially as it relates to our work as liberal educators. Contrasted with the caricature of the teacher who was overheard to announce: "When I want your questions I'll give them to you," we are encouraged to consider ourselves as facilitators, listeners, guides, and yes, fellow travelers, whose task, as noted by Chickering in his *Modern American College* "...is to develop intellectual competency...helping students move along the developmental continuum...(and in doing so)...likely to make a critical contribution to their ego development and to their moral and ethical development...their interpersonal competence, their capacity for intimacy and the development of their humanistic concerns..."

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Socrates and the Unresponsive Student

Robert J. Forman

On a warm afternoon, Socrates, while walking along the banks of the Ilissus, met Phaedrus, a young man who visits his circle occasionally. The following conversation ensued:

Socrates: Phaedrus, my friend! It's been some time since we've seen you in our little group at the Stoa.

Phaedrus: I've been busy, Socrates - lots of problems.

Socrates: Life can be that way. In my case, it's my wife, Xanthippe; she often says I should forget about teaching and do something useful - like stonecutting. I understand, though, that this moring was an interesting one, that Lysias the Sophist gave one of his epideictic speeches in the city.

Phaedrus: My parents made me go to hear it, said I couldn't go on that summer tour of the East unless I became more serious about my work.

Socrates: What did Lysias speak about? I'm sure your parents expect an account of what he said.

Phaedrus: I think it was about love, or something like that.

Socrates: What do you think about what Lysias said?

Phaedrus: I don't know; it was so boring - sitting in a hot lecture hall for over an hour listening to Lysias mumble. The cicadas in the plane trees were much more interesting, even though they kept saying the same thing. It sounded like: "Su-, su-, summer's coming! Su-, su-, summer's coming!" I kept thinking of the good time I'm going to have this summer on the Mediterranean with Melanippe!

Socrates: But surely you won't be able to go on your tour if you cannot present a satisfactory account of Lysias' speech.

Phaedrus: It's OK. I bought a copy of the whole thing from one of those "nerds" who sits in the front row taking down everything. I'm going to memorize it and blow dad and mom away with all those big words.

Something seems to have gone wrong in this little dialogue. Phaedrus, it appears, has wasted another morning at school, and Socrates is beginning to agree with Xanthippe about his returning to stonecutting. What is worse, one cannot help but feel that Phaedrus' parents are going to be satisfied with their son's memorized version of Lysias' speech, that this young scholar is just hours away from making final arrangements for his summer tour.

Would it be presumptuous to say that many teachers, on the undergraduate as well as the secondary levels, have had encounters with their pupils something like that of the Socrates and Phaedrus of this miniature dialogue? The Socrates of this little drama begins in the time -honored way, by seeking rapport with his student; yet, Phaedrus has attended Lysias' speech only because of what he will not be able to do had he not gone to hear it. As many contemporary students, he has made a decision for negative rather than positive reasons. The instructor's task is essentially to reverse such negative thinking, to ground each lesson in positive elements which allow only positive responses.

A related problem, which the Socrates of Plato's dialogue corrects and which forms a starting point for discussion in Plato's *Phaedrus*, is Phaedrus' uncritical acceptance of all that Lysias has said on the subject of love. Lysias' essential argument is that passion of a non-lover is preferable to that of genuine love because it provides greater security and material advantage to the individual who is the object of this attention. Phaedrus, like many contemporary students, is entirely willing to accept Lysias' defective arguments because they are convenient and, if practiced, yield attractive short term results. It is appropriate that the *Phaedrus* of Plato describes the passion of an exploiting lover. Socrates rightly sees that the real danger of this passion is intellectual prostitution.

The analogy of uncritically accepting attractive defective arguments to prostitution is apt, extreme as it may appear. St. Augustine, emphasizing the other side of the equation in his *Confessions 1.13*, recalls his own perfect but mindless recitation of a passage from Vergil's *Aeneid* with the disgust only his conversion to Christianity would allow. A former teacher himself, Augustine compares the classroom to a closet used for seducing children; by this he means that a setting for teaching what is attractive but untrue. Augustine, following Plato, demands that anything worthy of being learned has some higher referent, something beyond itself. For Augustine, as for the Church Fathers generally, this chain of learning inevitably leads to God, but Plato, and Aristotle too, believed in such a hierarchy. Common opinion (doxa) should be discarded to privilege true knowledge (episteme) since true knowledge fosters wisdom, a "moral sanity" they call sophrosyne.

For the contemporary student and teacher, the same principle of hierarchical knowledge developed through logical inquiry holds true, though in practice these ever-ascending chains are rarely demonstrated in the classroom. Too often, courses of instruction become a mass of material which must be learned in isolation. The brightest will make immediate connections, and, like Henry David Thoureau, make pursuit of knowledge their lifelong quest, but all too many will skim by with a broad but appallingly shallow grasp of thrilling, important ideas. It is an open and perhaps moot question whether any system of mass education can produce a body of individuals for whom inquiry and critcial thinking constitute the essential process of knowing. What is certain, however, is that methods which force some sort of critical response from even the most uncommunicative student can become an essential component of every class lesson. This, if nothing else, will open an avenue to critical thinking which some, at least, will continue throughout life. This paper will consider some of the most common obstacles to critical thinking one encounters in the modern classroom and suggest ways an instructor may use to combat them.

It is likely that no answer is more destructive to the morale of a class or to the ego of an instructor than the three ugly words, "it was boring." With one blow, the respondent has attacked the material as unworthy, the instructor's judgment in making the assignment as unsound, and the taste of any who might see worth in the material as faulty. Often, this answer is an attempt to disguise insufficient or no preparation, but it likely also masks an unsatisfactory ability to communicate or a feeling of impotence or inadequacy when unable to deal with challenging material.

Instructors have traditionally used several methods to respond to this problem, though none is particularly satisfactory. To remind students that they do not have to be entertained in order to learn is, at best, gratuitous, and our ficitive Socrates' response, essentially that "you won't...if you don't," is merely negative. Similarly, a question such as, "Just what do you mean by the word 'boring'?" is likely to produce an equally useless rejoinder such as, "It didn't hold my interest."

It is much better to select a single element of the assignment which satisfies the student's definition. Here, for example, are two sentences from Thomas Mann's novella *Death in Venice* important for a complete understanding of its protagonist, Gustav von Aschenbach:

> Outsiders might be pardoned for believing that his *Maia* [Aschenbach's novel] world and the epic amplitude revealed by the life of Frederick were a manifestation of great power working under high pressure, that they came forth, as it were, all in one breath.

And subsequently:

> The new type of hero favored by Aschenbach, and recurring many times in his works, [was a]...' ...conception of an intellectual and virginal manliness, which clenches its teeth and stands in modest defiance of the swords and spears that pierce its side.'"

Illustrations, starting with Francisco Goya's *Maja Vestida, Maja Denuda*, and concluding with Andrea Mantegna's *St. Sebastian* will force some kind of response. Why does Mann insert such allusions? Why is his reference to Frederick the Great pertinent? What does Mann imply when he notes that the motto by which Aschenbach has lived the first part of his life is "Durchhalten" ("hold fast")? And why is it significant that this was also Frederick's own maxim? The chain of questions is considerable, challenging but not intimidating, and has the advantage of relevance without the disadvantage of intimidation. Just as important, the visual element has the advantage of bolstering the comprehension of those best prepared while being evocative enough to produce critical response in even the least prepared. Essentially, it is a catalyst which meets contemporary students on their own terrain and begins a learning chain by which knowledge is deepened, not just broadened.

Thoreau always knew what he had to read next: Callimachus' pastorals led to Vergil's *Georgics* and these poems to the medieval herbals to Audubon, Charles Darwin, and Louis Agassiz, but Thoreau lived amid the elements which he studied. Teachers who have made learning their reason for living have similarly found their own way, but technologically-enriched contemporary students are, paradoxically, often intellectually impoverished because, good grades notwithstanding, critical inquiry has never been a component in what they have learned. They use television, calculators, and computers with impressive skill, but are absolutely guided by what appears on the screen.

It is important to emphasize that visual elements are but one of many ways to introduce critical response and that an instructor can insure some kind of worthwhile dialogue in almost any discipline. Douglas Hofstadter, a professor of computer science, introduces his students to the incompleteness theorem of Kurt Godel through the musical canons of Johann Sebastian Bach. His book, *Godel, Escher, Bach: An Eternal Golden Braid*, introduces the refinements of M.C. Escher's engravings, and rewritten fables based on Aesop. More than a few mathematics majors have seen the verbal precision of classical poetry translated as the numerical "golden mean" in George Duckworth's *Structural Patterns and Proportions in Vergil's Aeneid* and in his *Vergil and Classical Hexameter Poetry*.

An instructor need not reach beyond the discipline at hand to work for critical response. In fact, it is often regrettably the case that multi-disciplinary courses are too superficial to allow meaningful study in depth of important ideas. The best chances for successful encounter almost always can be found within the given required work. If, for example, Freidrich Nietzsche's *The Birth of Tragedy* is the work under discussion, it seems pertinent to start the chain of inquiry precisely where Nietzsche himself began it: establishing the differences between Apollo and Dionysus. Almost all students will have at least an acquaintance with the names of these Greek gods, but it will probably surprise many to learn that Apollo is associated with the sun and Dionysus with the wine grape only long after the myths had firmly placed them over the opposing but complementary domains of order and ecstasy.

If one accepts that establishing not just a response but a critical response is essential in whatever is taught, it becomes evident that successful teaching requires more than simply imparting a body of material. The instructor who attempts to elicit such response, however, faces the potential problem of appearing to manage rather than direct perceptions of students. This is particularly true when the instructor has a strong thesis (as should always be the case), but a class has, at least initially, little to say about a given topic.

Ideally, the instructor's view should remain oblique and be revealed only after as many positions as possible have appeared in class discussion, but this is not always easy to do, particularly if initial reaction to an important matter appears superficial or shallow. For example, returning to *Death in Venice*, the first reading of many undergraduates, particularly of those unfamiliar with the works of Schopenhauer or Nietzsche, may well be that Mann is concerned primarily with describing a middle-aged writer's discovery of his latent homosexuality and that the story represents personal tragedy. That Mann's theme is much more subtle, an artist's discovery of art's ambivalence, that it is rooted in a blending of order and ecstasy, is bound to appear glib, subjective, or contrived. To introduce this idea too soon, though it indicates an instructor's honest enthusiasm is, in effect, to jump beyond the stages by which it becomes consensus.

Plato's dialectic, the process of his dialogues, remains the tool most widely practiced for initiating critical inquiry in the modern classroom; yet, the deductive reasoning this process implies needs to remain with the student group and should not appear to be manipulated. Earnest instructors sometimes do this either by immediate subjective interpretation of a student's response or by immediately seeking another student's reaction to the first student's view. If the class is generally unresponsive, the second student is likely to agree with the first, merely to be spared further questions.

One never hears the moments of silence in Plato's dialogues; yet, they must have occured when Socrates taught. Such pauses can have the constructive effect of focusing attention on the point an instructor desires to make. Thus, teachers should never be afraid of what may seem awkward silence. It does no harm, after such a moment, to ask the group to remember but put aside for a time the unsatisfactory response and return to the source material of the lesson. To emphasize that Mann is concerned with androgenous ambivalence, an instructor might ask a class to consider Edvard Munch's painting "Family on the Road," then simply read Aschenbach's description of the Polish family in *Death in Venice*:

> The girls...were dressed with an almost disfigured austerity. All three wore half-length slate-colored frocks of cloister-like plainness, arbitrarily unbecoming in cut, with white turn-over collars as their only adornment. Every grace of outline was

> wilfully suppressed; their hair lay smoothly plastered to their heads, giving them a vacant expression, like a nun's.

Then, contrast Aschenbach's impression of Tadzio, the beautiful boy of the same family:

> Tenderness and softness, it was plain, conditioned his existence. No scissors had been put to the lovely hair that (like the Spinnario's) curled about his brows, above his ears, longer still in the neck.

Why does Mann so markedly emphasize the Polish family's austere spiritual appearance? Why is it significant that their clothes have "cloister-like" appearance, that they resemble nuns? How does this contrast with the appearance of Tadzio, the boy Aschenbach believes resembles the Spinnario? Finally, does one see the Nietzschean formula for art here, ecstatic sensuality against ordered austerity? Is it important that Tadizo's curled hair is compared to that of the Spinnario and subsequently to that of Antinous, the boy loved and immortalized in numerous statues by the emperor Hadrian?

From ugliness, beauty, from order, ecstatic disorder, from life, unselfconscious and unpremeditated art; this is the golden braid of Mann's novella, an ascending chain of ideas which can be followed to its conclusion: that there is art in the life of one who has lived for art, that the death of one who has seen the way to spontaneous art is not tragedy but triumph.

Socrates maintained that he did not teach but allowed others to learn. Increasingly, in the contemporary classroom, this goal implies establishing the chains of inquiry that technology, as welcome as it may be, has paradoxically thwarted and temporarily closing the chain so that it may be opened again in another context and at another time. It implies more than simply asking questions; rather, it must make student inquiry unavoidable. This is sometimes difficult, but nearly always possible. Socrates and Thomas Mann; Schopenhauer, Nietzsche, Edvard Munch, the Spinnario and Antinous; what could be further apart, and yet, what more closely related?

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Critical Thinking and Logical Self-Defense: Meeting The Language of Argumentation with Sensitivity

Michael A. Kagan

> *He who overcomes others has force;*
> *He who overcomes himself is strong.*
> *. . . of two sides raising arms against each other, it is the one that is sorrow-stricken that wins.*[1]

Argument is a form of intra- or inter-personal activity--we argue with ourselves and we argue with others. At times argument is dance; at times, meditation or prayer. Sometimes it's a solo, sometimes a group exercise. Sometimes argument is a cooperative search for truth--sometimes it is an armed struggle characterized by attack and defense. Cooperative search has had its advocates; yet competitive struggle seems to rule.[2] For those who would have it otherwise, who would prefer the emergence of cooperation, sensitivity, compassion, gentleness, and listening as the paradigmatic method of argumentation, it may be of interest to see how these more gentle modes can respond to direct force. We can take lessons about gentleness learned (strangely enough) from the martial arts and apply them to defending against verbal bullying of various kinds, to turning confrontations over initial positions into cooperative searches for truth.

In a confrontation, we are not surprised when a stronger individual overcomes a weaker. Whether the conflict be at the level of sticks and stones or at that of words, we are not puzzled when brute force prevails or the stronger case defeats the weaker. We do not look to the rhetorical or martial arts for an explanation. It is when the weaker overcomes the stronger that we look to such disciplines to find out why. If we witness a physical conflict in which the weaker or smaller party overcomes, we turn to the martial arts to understand the techniques and principles of this unexpected victory. When we witness a verbal conflict, an argument or debate, we direct our attention to the arts of rhetoric and logic--formal and informal.

Since the days of Aristotle, if not before, verbal disputation has at times been understood as a martial art. Aristotle criticizes some of his predecessors' argumentation with language appropriate to sloppy bar-fighting. He reproaches them for acting:

> . . . as untrained men behave in fights; . . . they go round their opponents and often strike fine blows, but they do

> not fight on scientific principle, and so too these thinkers do not seem to know what they say . . . .[3]

Much of Platonic and Aristotelian dialectic can be seen as accounts of practice drills,[4] free sparring, and heated combat--the stakes and prizes varying with the situation, involving at different times "face" in the sense of reputation and winning,[5] truth,[6] and life itself (e.g., Socrates' *Apology*).[7] Plato and Aristotle's understanding of logical self-defense is critical and self-critical, striving to contend with, yet not be infected by, the classical Greek machismo with its intense emphasis on victory.[8] Both Plato and Aristotle strive to surpass basic pugilism with a philosophical method that leads to the improvement of the student practitioner as a human being. This drive to transcend the immediate goal of victory in a particular conflict does not distinguish their arts of verbal self-defense from the apparently physical martial arts of others. As students of most of the Eastern martial arts will tell you, this two-fold goal of self-defense and self-improvement is common to Aikido, Tai Chi, Judo, Wing Chun, Kung Fu, Karate . . .

A martial arts understanding of logical self-defense has much to teach us, so long as we do not allow the imagery of physical confrontation to lead us into assumptions concerning opponents bludgeoning each other about the head, thinking only of victory and scoring points. To make the analogy work, it is worthwhile to remember that not all martial arts are confrontational (in meeting force with force) and that some emphasize gentleness, sensitivity, and compassion.[9]

These concerns of sensitivity are not high-minded platitudes, but are central strategic principles in several Eastern martial arts, particularly those characterized as "internal" or "soft" martial arts. Let me explain this terminology before going any farther. In general, those fighting forms that emphasize the redirection of one's opponent's force are called "soft" forms--examples of this are throwing techniques that rely on the on-coming force offered by one's fighting partner to accomplish the throw. Arts that meet force more directly, e.g., by interrupting the path of an attacking arm with a striking block, are usually called "hard" forms.

Even cursory research indicates that purely soft and purely hard forms are abstractions; each art contains hard and soft elements in varying proportions. For example, when we read among the classics of the Eastern arts, we encounter an emphasis on non-egoistic awareness of one's opponent[10] even in the "hardest" martial arts such as the Samurai sword principles and technique discussed in Musashi's *Book of Five Rings*.[11] Explicit discussions of the importance of sensitivity and compassion occur in and regarding the classical principles of Tai Chi Chuan, forms of which include some of the "softest" expressions of the martial arts.[12] These discussions seem to focus on a special kind of "listening" or non-projective awareness. These discussions seem to have something to teach us about how to better conduct our own verbal disputations, in arguments with students and colleagues.

Non-projective awareness means "listening" with all one's senses to one's fighting partner in order to know what s/he is about to do. Such listening requires three things: 1) that we already have a sufficient degree of self-knowledge that we need not worry about where and how we ourselves stand, 2) that we are familiar with the area and conditions in which the encounter is occurring, and 3) that we "know" our opponents--that we are able and willing to think and feel like and with them.[13] Though I will address these three factors separately, it is important to realize that during an actual argument they usually come towards us in complicated bundles.

1) In a physical conflict, the self-knowledge consists in having previously developed correct techniques, a good posture, and a well-rooted stance that allows us to devote our attention to the external. In a verbal conflict this may mean having thought through our positions so we are not busy planning out what we are about to say, or trying to work out some problem while our partner/opponent is speaking.[14]

2) Knowing the area and conditions in which the encounter is occurring can be crucial. In physical conflicts, this is the "home advantage" which seems to reveal itself in tennis matches, golf tournaments, and guerilla warfare. In verbal conflicts, this is the advantage of the one speaking from his or her own area. In modern scholarship, with so many of us focusing on narrowly defined territories, most of us have some area or other in which we are almost guaranteed to prevail. There is the haunting advice of a carnival worker who had just taken away my friend's paycheck, "never try to beat a carnie at his own game."

3) The third requirement is that we know our opponents--that we are able and willing to think and feel like and with them. Many of us are teachers, whose teaching includes reading argumentative writing, who try to make sense of our students' attempts to persuade. We often find students missing out on opportunities for genuine encounters with their opponents. We find them "preaching to the converted," offering arguments that only those who agree would find convincing. In martial arts like Tai Chi, the practitioner is taught to "listen" with all the senses, to relax despite the stress of confrontation, to cease making the kind of "noise" that obscures the opponent. In verbal conflicts, one needs to learn to "listen." Sometimes this listening occurs in a rough and ready face to face meeting; at other times, for example, when we read an article and attempt to evaluate it fairly, the task of listening can be undertaken more leisurely. In both cases it is worth asking a central question:

> What would the world have to be like for my interlocutor to make sense?[15]

In the Tai Chi classics it is suggested that non-projective listening allows the sensitive practitioner to know her opponent's intentions even before her opponent does.[16]

Projective listening, in contrast, is characterized by missing the point of an argument or attack. Signs of this include interrupting and completing an opponent's sentences incorrectly, the non-vicious use of straw-man type arguments, failing to counter important pre-suppositions involved in one's opponent/partner's attack, self-defeating (with respect to persuasion) insensitivity to an audience's or opponent's feelings, and being taken in by fallacies. In physical altercations, a sign of this kind of incorrectness is being struck repeatedly.

I would like to suggest that sensitivity and compassion provide effective sources of fallacy detection and defense. To do so, I will rely on a characterization of fallacy as itself often involving a maneuver based on an awareness of one's opponents' basic strategies, and I will emphasize the explicit power of the implicit in persuasive exchanges.

Discussion of particular strategies in informal debate will be taken from Suzette Haden Elgin's works on "The Gentle Art of Verbal Self-Defense." The theory of fallacy as an abuse of generally useful rules of thumb is based on my work on the fallacy of Abusive *Ad Hominem.*[17] The martial arts material and examples are derived from Tai Chi Chuan.

Strategy

There are many useful and insightful ways of understanding fallacy and the art of deception. Some focus on more formal or syntactic features of the technique involved, others take their start from pragmatic, e.g., psychological features, some both. I understand fallacies and the related arts of deception as strategies and counter-strategies that work by getting us to treat often implicit rules of thumb as if they were invariably true. Some of these implicit shortcuts are procedural and relate to discourse itself--we listen to what is explicitly said; we respond to the central point explicitly at issue. Other rules of thumb help us deal quickly with data signalling an impending future--when we hear hoof beats, we expect horses, not zebras.

We know (or at least ought to know) that our assumptions, stereotypes and generalizations usually are rules of thumb. They have exceptions. Consider the following: people stop at red lights; expensive things are worth more; a Nobel Prize winner is a credible authority; the testimony of the insane is unreliable; wholes reflect features of their parts; and so on.

One theorist of the fallacies, Nicholas Capaldi, in his *Art of Deception,*[18] argues that most fallacies reflect suppressed premises which are generalizations. I have argued that these suppressed premises work in the perpetuation of fallacy because they are usually versions of some reliable rules of thumb whose exceptions do not come to mind in time to forestall the fallacy. This is often due to the fact that the rules of thumb and useful generalizations are unstated. As long as they go without saying, they are not made explicit and subjected to criticism.[19, 20] In the following sections, I will attempt to give examples of the utility of sensitivity in argumentative defense and attack--in defending against as well as in offering challenges.

Defense: The Need for Sensitivity in Detecting and Defending against an Attack

In an argumentative situation we can ask the question, "what would the world have to be like in order for my opponent's utterance to make sense?" to unearth some of the implicit baggage in argumentative challenges. Consider the following enthymematic argument (A addressing graduate student B):

> "Even you could pass the comprehensive exams in this department, so there's no need to eliminate them."

The answer to a question about A's world shows that there is a lot going on here. For A's enthymematic argument to work, the world has to be one in which:

> 1) B is a poor student, at least with respect to the art of test-taking;
>
> 2) if poor students can pass an exam, so can better ones;
>
> 3) comprehensive exams should be eliminated if (and only if?) some students fail them.

In one sentence, A has defended the institution of comprehensives in A's department while implicitly suggesting that B is an unimpressive student, that virtually everyone, even unimpressive students like B can pass the comprehensives, and that unless people are failing them, such exams should be maintained. These seem to be the easily seen assumptions and presuppositions involved in A's attack. Many more may linger in the background; some may depend on the history of the argument between A and B, perhaps even on their personal lives. For example, A may be having an affair with the Department Chair or, less scandalously, A (or B) may have already passed the exams. Unless B is careful, B will end up consenting to some presuppositions through silence or B may be diverted by following the generally useful strategy of attempting to make one's point.

If B has studied, e.g., Elgin's work on verbal self-defense, B will be on the alert for such presuppositions through specific training. In terms of the implicit generalizations, if B has worked with enthymemes in an informal logic or rhetoric course, then B will have had practice in explaining why the premise about good students being able to pass exams passed by bad students is a questionable one. If B is highly sensitive and empathic for other reasons, then "nature" might do the job of Elgin's martial art here, for if B is a sensitive, compassionate individual, even under attack, B is in a better position to detect presuppositions and more easily imagine A's world picture (since B will care). And B can test his or her own empathic understanding simply by asking A questions like, "Are you presupposing that I'm a poor student, at least with respect to the art of test-taking?" Or, B might ask, "even granting that a poor test-taker, as you seem to think me to be, could pass these tests, why do you think a good student would pass the comprehensives (or that having a test a poor student can pass is a good reason for keeping it)?

"Attack": The Need for Sensitivity to Your Opponent's Concerns

In the previous argument example, I hoped to provide an occasion for seeing that a careful concern for and attentive ear to one's opponents, as well as to their claims, can sometimes unearth the implicit foundations on which they stand. In this section, I turn from the worry about defending against multifaceted attacks to that of offering our own challenges. Remembering the goal of turning confrontation to cooperation, we can ask not only, (1) "what would the world be like if this opponent's claims were true?", but go on to the empathic concern with, (2) "what must my opponent care about in order to have offered such an argument or to be worried about this among all possible issues?" Another example can be offered to show the role of empathy and compassion in challenging. Whether our intention be ultimately confrontational or cooperative, there seems to be a place for awareness of what our opponent cares about. This awareness can be derived from listening carefully to an opponent's set speeches and challenges, and through trying to imagine what the world looks like to the opponent by "becoming the enemy"[21] and then attempting to answer questions (1) and (2) about our opponent's world and concerns.

If the opponent, O, is present in a dialogical situation, hypotheses about O's feelings and concerns can be tested through direct questioning and observation before challenging O. Consider, for example, a case in which O argues for prescriptive ethical relativism and claims or suggests that we should be tolerant of other cultures' practices given the truth of some descriptive anthropology. Here, to offer a challenge based on O's commitment to the value of "tolerance" will not even make sense to O unless O has that kind of ax to grind, and really cares about tolerance. If O cares about something other than tolerance (e.g., freedom of religious practice), a persuasive challenge would need to address that concern instead. Here, we can teach our students the value of research for the conduct of this kind of argumentation with particular opponents. They may then learn to investigate their opposition before developing their arguments by addressing questions like, "what does this particular opponent or set of opponents or audience care about?", "how can my position address it?", and, leading to cooperative search, "can we develop or find some position that addresses my opponent's concerns without slighting my own?"

Summary

In this essay, I have suggested that there are useful analogies between verbal and non-verbal self-defense, that among these is an important role for sensitivity to opponents' points of view to promote better self-defense and understanding. To do this I have relied on an account of fallacies as abuses of generally useful shortcuts or rules of thumb, and have emphasized the role of the implicit in argumentation.

I think the analogy between verbal self-defense and non-verbal martial arts is a useful one, and that we should explore it in further discussions. For example, if informal logic and rhetoric are analogous to arts like Tai Chi or Kung Fu, then instructors may need to concern themselves more with the moral character of their students, and with avoiding the dangers of students being abused in sparring sessions. Further, we may learn something about grading from the martial arts--some of which use fixed grading systems (belts, etc.) paralleling the A-F system, while others avoid giving more than vague appellations like "beginner," and "advanced student." We might also wish to reinstitute the rhetorical institutions of disputations (and medieval obligations) among our more advanced students, and emphasize exercises that build sensitivity.

Handbooks for controlled individual sparring exercises may not be ubiquitous, but neither are they rare. We have Elgin's discussions and examples of particular attacks on the individual in her works on verbal self-defense. We have Cialdini's expositions of illegitimate persuasion through exploitation of standard shortcuts and rules of thumb. We have a wealth of work on informal logic and logical self-defense from the dialectical works of Plato and Aristotle, to Blair and Johnson's more recent *Logical Self-Defense.*[22] One last area of concern is the continued need to worry about the Delphic maxim to know ourselves, and to wonder about the possible relevance of the teaching in most martial arts that our greatest opponent may be inside our own skin.

This essay began with a citation from the *Tao Te Ching*; let it end with some words from Talmudic literature:

> "Who is a heroic warrior? The self-conqueror."[23]
>
> "Who is the greatest of heroes? One who turns foe into friend."[24]

Notes

1. Lao Tzu, *Tao Te Ching*, translated with an introduction by D.C. Lau (Harmondsworth, Middlesex, England: Penguin Books, Ltd., 1963), Chapters XXXIII, and LXIX, pp. 92, 131.

2. Philosophers need not look to the law courts to see a predominance of confrontation over cooperation. We can often find it in articles, debates, and meetings. A useful discussion of confrontational strategy occurs in Janice Moulton's "A Paradigm of Philosophy: The Adversary Method" in Sandra Harding and Merill B. Hintikka's (eds.) *Discovering Reality, Feminist Perspectives on Epistemology, Metaphysics, Methodology, and Philosophy of Science* (Dordrecht, Holland: D. Reidel Publishing Company, 1983), pp. 149-164.

3. Metaphysics, 985a 10-18 (W.D. Ross's translation), in Richard McKeon's (ed.) *Introduction to Aristotle* (New York: Random House, 1947), p.253.

4. Gilbert Ryle has much more to say about dialectical training drills, e.g., *Plato's Progress* (London: Cambridge University Press, 1966), pp.104-105.

5. E.g., the sparring discussed in Aristotle's *Topics* or Plato's *Euthydemus*.

6. As Aristotle puts it, "For the study of the philosophic sciences it (this treatise on dialectic])is useful because the ability to raise searching difficulties on both sides of a subject will make us detect more easily the truth and error about the several points that arise." *Topics*, Chapter 2, Book 1, 101a-35, translated by W.A. Pickard-Cambridge in McKeon's (ed.) *Introduction to Aristotle*, p. 199).

7. It's useful to remember that (for those who could afford it) the education of Greek citizens was the education of warrior knight heroes obligated to defend themselves and their masters in any arena of conflict, whether it be the court of law or the battlefield. See H.I. Marrou's *A History of Education in Antiquity* (trans. George Lamb, New York: Sheed and Ward, Inc., 1946), pp.9ff., for a fascinating discussion of classical training based in the Homeric ideal of the orator/warrior.

8. E.g., Aristotle's claim in the Topics (Book VIII, xiv, 164b 8-15) that we should choose our opponents carefully, "for with a man who tries every means to seem to avoid defeat you are justified in using every means to obtain your conclusion, but this is not a seemly proceeding." (E.S. Forster's translation of the *Topics* in *Aristotle: Posterior Analytics* [trans. Hugh Tredennick] and *Topics* [London: William Heinemann Ltd., 1960], p. 739).

9. E.g. 'Judo' can be translated as 'gentle way,' 'Aikido' as 'way to union with spiritual energy.'

10. Discussed below as "non-projective" awareness.

11. E.g., Miyamoto Musashi's injunction to "become the enemy." "'To become the enemy'," he explains, "means to think yourself into the enemy's position." (*A Book of Five Rings*, trans. by Victor Harris, [Woodstock, New York: The Overlook Press, 1974], p. 75).

12. See e.g., Master T.T. Liang's *Tai Chi Ch'uan for Health and Self-Defense* (Boston: Redwing Book Company, 1974), pp. 64-72; and also Jou Tsung Hwa's *The Tao of Tai Chi Chuan* (ed. Shoshana Shapiro, Ph.D.), pp.243-244. Master Jou there discusses the importance of "listening" in the context of Sun Tzu's (see next note) teaching concerning the knowledge necessary for the warrior, and analyzes a teaching from the Tai Chi classics where 'tsou,' 'leading by walking away' is explained as the act of 'overcoming the strong and hard by the gentle and soft way.'" (Rutland, Vermont: Charles E. Tuttle, Co., 1980).

13. The classic statement of these three principles as found in Sun Tzu's *The Art of War* (ed. James Clavell): "If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained, you will suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle" (New York: Delacorte Press, 1985), p. 18.

14. Often, it is self-development and constant preliminary practice that permit artists not to think of themselves.

15. This formulation follows Suzette Haden Elgin's in *The Last Word on The Gentle Art of Verbal Self-Defense* (New York: Prentice Hall, 1987), pp. 24-25. Elgin quotes George Miller's statement, "In order to understand what another person is saying, you must assume it is true and try to imagine what it could be true of." (Elgin cites, "'Giving away Psychology in the 80's: George Miller Interviewed by Elizabeth Hall," *Psychology Today*, January, 1980, p. 46.")

16. According to the Tai Chi Classics, the competent practitioner is perceived like "nothingness" when touched, close when defended against, distant when approached (see Master Jou's translation, discussion, and commentary in *The Tao of Tai Chi Chuan*, pp.179-184).

17. "Psychology vs. Religion--*Ad Hominem*?: The *Ad Hominem* Fallacy and Freudian and Skinnerian Psychological Criticism of Arguments from Religious Experience" (Ph.D. dissertation, Washington University in St. Louis, 1988).

18. Second edition (Buffalo, New York: Prometheus Books, 1979), pp. 183-184.

19. This account of such fallacies follows that of "Psychology vs.Religion--*Ad Hominem?*," Chapter Two.

20. In *Influence: The New Psychology of Modern Persuasion* (New York: Quill, 1985; originally published as *Influence--How and Why People Agree to Things*, New York: Morrow, 1984), Robert B. Cialdini, a social psychologist specializing in the area of influence, has argued that virtually all illegitimate persuasion occurs as a result of deceiving us on the basis of our own generalizations. Though not himself explicitly concerned with informal logic, he provides a range of useful data and theory regarding the successful application of many fallacies.

21. See Musashi's discussion in note 11.

22. Ralph H. Johnson and J. Anthony Blair, Logical Self-Defense, second edition (Toronto: McGraw-Hill Ryerson Limited, 1983).

23 Tractate *Avot* 4.1; a more literal translation: "Who is a hero? He who conquers his [evil] inclination."

24. *Avot DeRabbi Nathan* 23, amended translations of passage as cited in Reuven Alcalay and Mordekhai Nurock's (eds.) *Divre Chachamim* [*Words of the Wise*] (Jerusalem: Masada Press, Ltd., 1970), p.215. Their translation differs in reading, "He who makes his foe his friend."

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Toward a More Commodious Academic Discourse

Carol Huber

Having developed out of schools designed to prepare young men and having been run for centuries by males, our academic institutions employ strategies for teaching that, by in large, go unquestioned despite the fact that they alienate many female students. The thesis-driven argument, the primary form of academic discourse, is, on the basis of anecdotal reports as well as research on sex differences, incompatible with most female students' preferred styles of learning. Yet, despite its incompatibility, adversarial discourse remains the principle means for gaining status in professional and academic communities. Adversarial discourse, the basis for formal logic, is so widely accepted as the paradigm of philosophic reasoning in the West that few question whether the best reasoning evolves in a climate of verbal and intellectual contest, and fewer still concern themselves with the reluctance of female students to engage in combative discourse. This paper argues that alternative discourse forms, less alienating to females, deserve more attention from educators seeking to foster critical thinking.

According to Janice Moulton (1983), the adversary paradigm leads us to associate critical thinking solely with combative discourse. It is assumed that the only way to reason soundly is to test a thesis by directing it to an opponent and mustering all the evidence one can to support it (p. 153). The long hegemony of adversarial discourse in Western philosophy has caused us, she claims, to ignore other forms of reasoning, such as reasoning used to "figure something out for oneself, to discuss something with likeminded thinkers, /or/ to convince the indifferent or the uncommitted" (p.159). She argues that such reasoning, which she associates with Platonic dialectic, can be as rigorous and systematic as adversarial discourse.

Adversarial discourse derives from the thesis-method of teaching, what Walter Ong (1981) calls the "agonistic" tradition, from the Greek root 'agon' which means contest (p. 21). The agonistic mode has dominated male-centered educational institutions since classical Greece. Classical rhetoricians developed this method to train young men to public life by teaching them to settle conflicts through verbal techniques that assert dominance. Ong stresses the fundamental violence of the agonistic tradition, particularly after the classical period when young boys were forced through corporeal punishment up through the nineteenth-century to learn Latin, a dead language that separated them, and thus psychologically distanced them, both from their "mother" (native) tongue and from women. The academic world, he writes,

> has in the past been conspicuously dominated by agonistic

> activity and structures--from its beginnings in the ancient rhetorical and dialectical tradition in the West and comparable traditions elsewhere through later academic and educational practices dominant until the advent of the Romantic movement, which reduced or masked the agnostic mind-set in academia but did not eliminate it. (p. 29)

Beginning in the fifth century B.C., the agonistic tradition required students to submit to public oral disputations or examinations up through the nineteenth-century. Today the thesis-driven argument is still the preferred form of academic discourse, although modern students produce written examinations and research papers rather than orations. The first criteria for judging these written products is still whether they contain a thesis which the essay proves. The measure of intellectual achievement throughout Western culture has been and remains, as James Boyd White (1985) notes, a speaker or writer's capacity to "reduce others at /his/ will" (p.110).

Traditional agonistic pedagogy developed in classical times because it served ancient beliefs about knowledge. In the classical period, reality was regarded as knowable because it was understood to exist apart from its preceptors in a stable form, accessible through rational inquiry. To know reality, students had only to learn to use stratagems that discovered truth beneath the flux of everyday experience, such as Aristotle's common topics or Hermagores' tactic of thesis and stasis. Once truth was uncovered, it became part of the cultural heritage which speakers and writers were obliged to present and defend publicly. The moral imperative for students in the classical agora or academy was to learn to make truth prevail in public discourse through appeals of logos, pathos, and ethos, because the ideal classical orator was the repository of his culture, its embodiment and spokesperson (Ong, p. 126).

The model of composing which we have inherited from the Western tradition is inherently authoritarian. Apart from writing produced in revisionist composition classrooms and in women studies programs, most writing in universities is treated as a product that must be judged by authorities who impose a hierarchy of learned values gleaned from ideal texts that embody disciplinary strategies for discourse. For this reason, Donald Bartholomae (1986) writes,

> The student has to appropriate (or be appropriated by) a specialized discourse, and he has to do this as though he were easily and comfortably one with his audience, as though he were a member of the academy or an historian or an anthropologist or an economist; he has to invent the university. . . (p.142)

Accordingly, students write badly, Bartholomae believes because they are asked to master a kind of "bastard" discourse that engages them in "knowledge-telling" (p.144), and their attempts to mimic authoritative discourse simply make them subject to language they "can neither command nor control" (p.142).

If academic discourse is difficult for students in general, it is doubly hard for females for a variety of sociological and psychological reasons. In order to appropriate the discourse of an academic field or profession, a student must develop a position of privilege that, to quote Bartholomae, "sets him against 'common' discourse" (p.156), so that he can define himself against "some more naive way of talking" (p.153). Females in our culture, according to research, "have more difficulty than boys and men in asserting their authority or considering themselves authorities; in expressing themselves in public so that others will listen; and in gaining respect of others for their minds and their ideas" (Belenky *et al*, 1986, p. 5). Recent studies continue to report that women find the academic environment profoundly alienating, despite institutional legislation, policies, and instructional guidelines (Treichler and Kramarae, 1983), and I believe one reason is the nature of academic discourse.

Paula Treichler and Cheris Kramarae (1983) summarize research into male and female interaction patterns in the following ways. Studies of male interaction show that males are socialized into peer-structured activities as children and, in the absence of an authoritative mediator, learn to settle differences through persuasion: they learn to assert positions of dominance, attract attention and maintain an audience, and be assertive when other speakers hold the floor. These patterns carry over into adult male interaction, where men feel comfortable using verbal techniques to assert dominance. On the contrary, studies of female interaction show that girls are more often socialized into engaging in adult-guided activities or into playing in small, homogeneous, leaderless groups: girls' social relationships teach them that everyone is supposed to get along, so they learn to mediate, submerge, transform, and resolve conflict through talk. These patterns influence adult female interaction, making women more prone to ask questions than men, more prone to listen to others, and less eager to speak out--all tendencies that have been considered signs of powerlessness, subjugation, and inadequacy (pgs. 119-120).

According to Mary Field Belenky and associates (1986), developmental psychologists who co-authored *Women's Ways of Knowing*, women see combative discourse as largely an empty exercise (p. 110). They found among the women they studied, 135 women at nine different academic institutions, a preference for what Adrienne Rich (1979) calls discourse "in the style of community" (p. 112). Even though women are capable of detecting "specious reasoning and of finding rational grounds for disagreement," most said they used adversarial discourse merely as a means "to prove their worth to /male/ authorities" (p. 111). Whereas adversarial rhetoric is grounded in an epistemology of separation, suppression of the self and assumption of as impersonal a stance as possible toward the object of knowing, women apparently rely upon "procedures for gaining access to other people's knowledge" from shared talk and shared perspectives (113). Distrustful of the world set forth by authoritative discourse, women use what Belenky and associates call "connected" knowing (p. 102) . This epistemology accords with the picture of female psychology drawn by Carol Gilligan's *In a Different Voice: Psychological Theory and Women's Development* (1982), which asserts that males tend to value individualism and base their actions upon established hierarchies of right and wrong, whereas women tend to value connectedness and make their decisions in terms of human relationships.

On the basis of such studies, feminine talk in our culture can be characterized as more often seeking to affect the interior consciousness of those to whom it is addressed than seeking to affect some external situation. Women apparently are less concerned with proving opponents in error than with changing their thinking. That is, feminine talk concerns itself less with the establishment of individual authority than with negotiation of a mutual reality. Obviously, feminine talk is not used exclusively by females, any more than masculine rhetoric is used exclusively by males. In fact, Ong insists since the nineteenth-century there has been an "inward turn of consciousness manifested in narrative, in scholarly work, and in the explicit attention to the person--the human interior" (p. 202). He refers to this inward turning as a "feminization" of consciousness, citing phenomenology, existentialism, personalist philosophy, dialogic philosophy and modern psychology as manifestations of this feminization.

A new view of knowledge, put forward in the 20th century by such diverse thinkers as Thomas Kuhn, Richard Rorty, and Clifford Geertz, also reflects this turn away from authoritative discourse. Social constructionist thought treats entities we call reality as linguistic constructs, engendered within communities of like-minded peers who have available to them shared resources of language. To borrow Kenneth Bruffee's illustration, Americans understand their political reality in terms of language made available to them by such documents as the *United States Constitution*, the *Declaration of Independence*, and the *Bill of Rights* (1986, p. 774). This epistemology is changing the way we think of writing and language: all verbal expression is being reconceived as dialogic.

Composition theorists who look at writing from a social constructionist perspective find support for their ideas in the work of Russian literary theorist Mikail Bakhtin who regarded all language as social:

> The living utterance, having taken meaning and shape in a particular historical moment in a socially specific environment, cannot fail to brush up against thousands of dialogic threads, woven by sociolinguistic consciousness around the given object of the utterance; it cannot fail to become an active participant in social dialogue (1981, p.276).

To Bakhtin, all verbal utterance is inescapably dialogic, always partly a fusion of other voices and an expression of a writer's own voice. Such a conception of utterance makes the issue of intertextuality significant: establishing an authoritative voice in a written product becomes less important than studying the interplay of voices that shape it and give it meaning. Each occasion for writing, therefore, invites writers to examine their ideas in relation to the on-going conversation of humanity and to insert themselves self-reflexively into this dialogue.

Elizabeth A. Flynn (1988) recently characterized the emerging field of composition studies as "a feminization of our previous conceptions of how writers write and how writing should be taught" (p. 423). Modern revisionist writing theory, she explains, has exposed the limitations of previous authoritarian product-oriented approaches through its demystification of writing by established authors. Its focus on the processes writers employ is changing our attitude toward invention. Traditional pedagogy regarded invention as a private, asocial act of recollection in which thinking came first and writing followed. Thinking in such terms, more often than not, meant thinking along the lines of authoritative voices, and writing meant, more often than not, replication of canonical views. Revisionist composition theory, on the other hand, understands invention as a long process of sometimes painful thinking and rethinking that involves a great deal of discovery, thinking, writing, and rewriting, finding voices, discarding of voices, and dialogue with self, others, books, and, of late, electronic devices.

Flynn notes that students, by consequence, are learning that "creativity is an activity that results from experience and hard work" (p. 423). This is primarily because revisionist composition pedagogy focuses on formerly ignored forms of writing that foster students' interactive invention of self and reality through language. In many composition classrooms, it is now commonplace for students to engage in productive uncertainty: to write exploratory drafts prior to expository essays, to use organic explorations of their topic before worrying about clearly evoking a thesis, and to respond to both their teacher and their textbooks in journal entries and freewritings. In addition, teachers employ small group work, collaboration, critiquing, reader-response, and principles of Socratic dialogue as pedagogical tools. And, writing-across-the-curriculum programs are attempting to transform pedagogical practices in disciplines outside of English on the grounds that such theory and praxis enhance critical thinking.

Many courses that attempt to foster critical thinking put their emphasis on analysis and assessment of arguments advanced by others and stress formal logic and rules of valid inference. They reinforce the lessons of the agonistic tradition and do little to train students to respect and tolerate ambiguity during the *process* of generating clear cogent arguments. Modern reconceptions of writing as dialogic, however, press forward the ideal of questioning "truths" arrived at without difficulty and of examining other possibilities before rushing to a conclusion. Whereas a rush toward a defendable position cuts off inquiry--and hasty movement toward closure drives a writer to present readers with only the option of agreeing or disagreeing--a forestallment of conclusion permits active questioning. When students become immersed in questioning authoritative positions, such questioning not only transforms their understanding of positions but also transforms them as knowers. Through questioning, they learn to see writing as a means of unfolding truth rather than mimicking what has been given them. Such questioning should produce an informed perspective by the time a student arrives at a thesis.

The model for discourse advanced by revisionist composition theory invites students to see themselves as participants in the on-going conversation of humanity. Ultimately, it invites them to reimagine themselves and their realities by joining their teachers in the process of naming and renaming categories of experience. For males and females alike, discourse becomes a means of clarifying beliefs rather than confirming what students take for granted as true simply because it is presented by authorities--a means for transformation as well as transmission of knowledge.

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Dialogical Teaching and Popular Culture

Richard Porton

The ideological conundrum of what is neutrally referred to as "popular culture" and derisively labelled "mass culture," has inspired two closely aligned theoretical approaches. An influential critical orientation, perhaps best represented by theorists such as Adorno, Horkheimer, Marcuse, and Lowenthal, views popular entertainment as thoroughly debased, incapable of aesthetic subtlety or the promotion of critical reflection. According to Marcuse, for example, mass culture ultimately conspires in reinforcing what is labelled the "affirmative culture," necessitating the harnessing of "power to break the power of established reality" (Marcuse, 1968): the force of negation that Frankfurt theorists have traditionally seen embodied in modernist or avant-garde modes, which are claimed to retain critical potency despite (or perhaps because of) their basically hermetic status. An alternate approach, inspired by the work of Ernst Bloch and Hans Magnus Enzensberger and an endless array of film and television theorists has provided a welcome corrective to some of the Frankfurt theorists' more reductionist pronouncements, despite the tendency of many recent critics to glibly stereotype Adorno et. al as irrevocably "pessimistic" or "elitist." Since it would make little sense for those who derive considerable pleasure (as well as their livelihood) from the analysis of film and television to damn popular forms as irredeemable, reified kitsch, these critics, with variable degrees of success, attempt to walk a dialectical tightrope. Popular culture is, therefore, not viewed as an ideological monolith, but as a multi-layered terrain which contains pockets of resistance as well as the residue of conformism and dominant ideology. Unlike earlier theorists who tended to view popular culture as a commodified wasteland in which there was little hope of differentiating between competing products, writers such as Stuart Hall and Tony Bennett use the arsenal of textual analysis to locate specific oscillations between "emancipatory" or "utopian" moments and ideological quiescence which often mingle uneasily within the same film or television program. While this approach has proved a useful impetus for some of the most interesting work in cultural studies, an unrestrained celebration of popular culture in recent post-modernist criticism has provided a somewhat caricatured rendering of the themes lucidly explicated by Hall and his disciples.

The television theorist John Fiske, for example, begins a recent book by "thanking the producers and distributors of popular television, so often cast as the scapegoats for the ills of capitalist society" (Fiske, 1987). He then begins the somewhat Panglossian task of lauding *Miami Vice* and a fistful of Madonna videos for their irony and intertextual verve. This account of popular culture appears to offer a funhouse mirror inversion of the Frankfurt School's gripes concerning what was termed the "culture industry": a route has been traversed from a somewhat unnuanced depiction of a totally manipulated society to an account of television which seems to imply that its overweening banality can be transformed by the power of positive thinking.

The nuances of the "mass culture" debate have not been neglected by individuals, primarily Paulo Freire and his protoges, who have attempted to define the contours of a radical pedagogy which encourages "critical consciousness," in contradistinction to the received ideas of the "affirmative culture." In many respects, Freire's analysis of popular culture conforms to the Adorno-Horkheimer model. The Freirean educator Ira Shor describes "demobilized masses of people... channeled into spectatorism...following the glamorous lives of film stars and jet setters, activated by experts, authorities and opinion-makers from the mass media" (Shor, 1980). Nonetheless, Friere's conception of "dialogical teaching" is designed to provide students, individuals considered quite susceptible to the allure of "spectatorism," a means to emerge from the slough of despond of massification. Dialogue is posited as the linchpin of liberatory education, since in contrast to the assumptions of conventional pedagogy and the more egregious forms of popular culture, students are not viewed as empty receptacles but as conscious agents who have the potential to transform their own lives. The dialogical model of pedagogy seeks to challenge the characteristically passive role of the student, as well as the traditionally autocratic demeanor of the teacher. Freire's dialogic emphasis coincides with the recent concern of film theory with the reception of texts as well as the traditional preoccupation with the texts themselves. Of course, there is a danger, not entirely alien to certain currents within reception aesthetics, that reception will be quantified and idealized in a manner that evokes the platitudes of mainstream sociology. Needless to say, a dialogic pedagogy should not uncritically enshrine students' responses to popular culture, but enable them to critically analyze these "artifacts of daily life" in a manner that promotes their own self-liberation. Text and reception are viewed as part of a dialectical movement which considers the acquistion of knowledge as a dynamic process, rather than the contemplation of a static object. In Enzensberger's oft-quoted formulation, "consumption as spectacle is- in parody form- the anticipation of a utopian situation," (Enzensberger, 1982), and attempts to locate both the utopian and overtly manipulative elements of popular culture are closely aligned to Freire's advocacy of "critical literacy." According to Henry Giroux, "culture must be analyzed as something that students can construct and appropriate in order to understand themselves as agents who can engage in the task of social and political reconstruction," (Giroux, 1982).

An analogous process of reconstruction and appropriation is apparent in the efforts of film scholars to refashion the study of genre theory. Earlier approaches within film theory and teaching tended to give short shrift to the study of genre: the romantic taxonomy of auteurism and the strategy of "hibernation" favored by the avant-garde both heaped disdain on the popular genres that were deemed inherently uninteresting, unless some alchemical "genius" came to the rescue of the realm of the lowest common demoninator. Yet as interest has veered away from a concern with the imprimatur of genius that has traditionally fascinated both auteurists and avant-gardists, an interest in the more commonplace pleasures of the standard genres (roughly analagous to Barthes' textes de plaisir) has assumed a more prominent place within film studies.

Interestingly, some of the most noteworthy attempts to come to terms with the interplay of ideological conformity and subversive moments within popular film genres have come from feminist film theorists. In Freirean classrooms, challenges to sexist culture are part of the process known as "conscientization": the pedagoic tenet which asserts that critique and praxis are indivisible. Much feminist work on film genre has affinities with this dual movement of conscientization; an analysis of narrative patterns within Hollywood cinema that reinforce male dominance fused with critical strategies intended to undermine this dominance. Yet while many Freireans (e.g. Shor) continue to view mass culture as primarily an impediment to conscientization, feminist work on Hollywood genres endeavors to disinter both the pleasure that women have historically derived from Hollywood melodrama, and the reified core of these films that inevitably colors, and deflects, that pleasure.

Mary Ann Doane's recent monograph on the "woman's films" of the 1940's presents an analysis of the structural contradictions between the tangible pleasures offered by these films featuring long-suffering heroines and the claustrophobic ethos of domesticity that pervades most of them. An example of this narrative tension surfaces in Doane's examination of the exaltation of love in many 40's melodramas:

> In a patriarchal society, the myth of romantic love is always there to act as an outlet for any excess energy the woman may posess, to, somewhat paradoxically, domesticate her. But, it is precisely because there is so much at stake here that the genre has the potential to interrogate the woman's position to explode in the face of patriarchal structures. For the myth of romantic love is at odds with the routinized work expected of women and this is a structural contradiction that generates others (Doane, 1987).

Doane's assertion that the "woman's film," however unwittingly, succeeds in interrogating the "woman's position" it simultaneously affirms has useful implications for critical pedagogy. What might be termed the liberatory crevices within what was traditionally viewed as standard pulp are certainly pertinent to the ongoing project of participatory learning. For Freire, crucial interchanges between students and teachers always pose epistemological issues. A dialogical approach to the aporias of romantic love that manifest themselves in Hollywood melodrama has affinities with the educational challenges posed by what Freire terms the "gnosological cycle": the concept that asserts that the production of knowledge and its subsequent apprehension are dialectically intertwined. Since genre studies, particularly the examination of the woman's film, adopt an approach which tries to balance aesthetic considerations with analyses of what is termed the "construction of the spectator," it might be deemed a field of study that scrupulously avoids the mere "transference" of knowledge that Freirean concepts such as the "gnosological cycle" are at pains to avoid." Annette Kuhn's claim, for example, that melodramas and soap operas offer the female spectator "a position of mastery" (Gledhill, 1987) that inevitably alternates with a masochistic subject position certainly has affinities with critical pedagogy's preoccupation with the subjective dimension of learning. After all, Freire urges students to cease being "mere spectators, uncross their arms, renounce expectancy, and demand intervention!"

The Hollywood melodrama, to be sure, would seem like an unlikely catalyst for this sort of interventionist zeal, but the "radical ambiguity" (Elsaesser) (Gledhill, 1987) which suffices the genre has prompted feminist theory to question claims that the archetypal "woman's film" is merely a perverse expression of ideological homogeneity. In fact, much of the writing on this genre argues that any such homogeneity can often be seen collapsing under the weight of the conflict between the superficially saccharine veneer of many of these films, and the radical subtext that often threatens to subvert the equilibrium melodrama, often futilely, strives to attain. This is the primary reason why "irony" is a word that recurs in melodrama criticism, although irony is seen as a component of nascent critique rather than the apolitical trope celebrated by the New Critics. For example, Elsaesser describes the protagonists of Hollywood melodrama as "characters made for operettas" who, however unwittingly, "experience the contradictions of American civilization," (Gledhill, 1987). The films of Sirk and Minnelli are seen as exemplary manifestations of melodramatic critique, since the conflict within these films between a style so frenetically expressionistic it verges on hysteria and rather conventional narrative bromides make them illustrations of negative capability gone gaga. It is this type of disequilibrium that interests feminist critics, since these films, with all of their nominal obeisance to the status quo, often are filtered through the perspective of women protagonists for whom the "proverbial American dream has become a nightmare," (Gledhill, 1987). Since the post-war era marked the high-water mark for these films, domesticity, and the nuclear family in particular, provide the raw material for the frequently overwrought mise-en-scene. The alcoholism, infidelity, and madness which plague these films' protagonists helps to successfully mock the ideal of familial harmony that was a key element of postwar ideology. Recent self-reflexive permuations in the genre have brought to the surface preoccupations that remained submerged in the films of the 40's and 50's. Fassbinder's *Lola*, for example, self-consciously appropriated the conventions of postwar Hollywood melodrama for explicitly political purposes. The eponymous heroine's blatant opportunism is juxtaposed with the corrupt frenzy of Germany's so called "economic miracle": domestic bliss is depicted as subservient to avarice. While many Freirean accounts of popular culture concentrate on the "symbolic violence" that is put forward as an inevitable trace element of mass art, the feminist reappraisal of melodrama proves that the despised artifacts of mass culture are actually more problematic than may be initially apparent. Moreover, since an assault on sexism is an important part of critical pedagogy, one might well ponder Andreas Huyssen's contention that "during the nineteenth century mass culture somehow became associated with women while real, authentic culture remained the prerogative of men," (Modleski, 1986). Since the distribution patterns which prevailed during Hollywood's heyday instructed directors such as Sirk, Stahl, and Minnelli to gear their films toward what was regarded as "women's realm," films such as *Stella Dallas* and *Imitation of Life* belong to the same variant of mass culture that has always been the object of male disdain ("modernism's other" according to Huyssen) and can be traced back to the kind of popular novels that Flaubert seemed to imply were responsible for Emma Bovary's demise. One of Ira Shor's pedagogical exercises encourages students to employ "mass culture against itself" by urging them to write and enact their own scenarios. The recent reclamation of melodrama by women directors might be considered a parallel strategy that isolates the genre's subversive kernel while endeavoring to expunge the paternalistic gloss which has traditionally accompanied it.

In an interesting excursus during a discussion of critical literacy, Freire reaffirms his commitment that "any radical pedagogy must understand the dynamics of resistance on the part of learners," and points to the work of a Brazilian educator who maintains that popular "festive moments" (Freire and Macedo, 1987) should not necessarily be dismissed as empty frivolity, but can be considered potential harbingers of cultural resistance. Film genre theory has also stressed affiliations between festivity and insurgent aspirations. The musical film has proved to be a particularly salient case study, since it is one genre in which conservatism and rebellion converge and often collide. This kind of contradictory meld is thought by Jane Feuer to derive form the fact that the "Hollywood musical as a genre perceives the gap between producer and consumer, the breakdown of community designated between performer and audience, as a form of cinematic original sin," (Feuer, 1982). In other words, although the musical pays allegiance to the strictures of mass art, it has not entirely eradicated the traditions of folk art and popular tradition which gave birth to this hybrid form. Thus, a nostalgia for community permeates the musical, and the genre does its utmost to integrate even its most recalcitrant protagonists into a universe of discourse where community reigns supreme. Obviously, this dynamic has many conservative resonances. The communities idealized in films such as *Oklahoma!* and *Seven Brides for Seven Brothers* do not give hints of a social order in which iconoclastic behavior would be tolerated and rebellion encouraged. Yet despite the conservative momentum toward social integration in these films, the emotional release offered by the choreography and musical numbers suggests a dimension of affect that is discontinuous with many of these films' overweeningly conservative orientation. Beneath the veneer of streamlined efficient entertainment, spontaneity, however contrived, yearns to break free. The type of ideological paradoxes generated by a genre such as the musical can illuminate, in perhaps unexpected ways, the blight of "cultural invasion" which Freire rails against in *Pedagogy of the Oppressed*, (Freire, 1973). What Freire terms "cultural invasion" is the apogee of anti-dialogical patterns of domination, and mass culture, which is often thought by Freirians to be a somewhat tentacular alien force, might well be viewed as a primary example of this invasive current which prevents individuals from locating the source of their own oppression. Yet vestiges of a utopian sensibility, even those entrenched in forms that reflect the prevailing doxa, cannot be perfunctorily dismissed. Although Feuer acknowledges that musicals offer a "version of Utopia that is entirely solipsistic," she also asserts that "they give us a glimpse of what it would be like to be free," (Feuer, 1982). This dual trajectory explains Feuer's diligent examination of the self-reflexive musical, the generic option which bifurcates its narratives into two worlds: a quotidian workaday world and an alternative universe in which latent possibilities and dreams can be realized. Of course, these alternative worlds are often self-consuming artifacts, since the glitter of show business itself is often put forward as the modus operandi for utopian transformation. Nonetheless, at least the possibility for some kind of transformation, however compromised, suggests that there might be liberatory chambers within the edifice of not quite guileless entertainment. Freire observes that "the revolution is born as a social entity within the oppressor society; to the extent that it is cultural action, it cannot fail to correspond to the potentialities of the social entity in which it originated," (Freire, 1987). To the extent that genre theory can point the way to liberatory possibilities deeply embedded within the core of a society which remains profoundly undialogical, its aims can be considered congruent with the goals of Paulo Freire's critical pedagogy. The British television playwright Dennis Potter, who has a jaundiced but not unaffectionate view of popular culture, has described himself as an interloper within the regime of the "occupying power," (i.e. television) (Potter, 1984). A demystificatory approach to popular culture can help us all attain the status of salutary interlopers.

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Engaging Students in Critical Thinking Tasks in Academic Courses

Each paper in this section presents an approach to the teaching of critical thinking within the content of a regular course within a particular discipline. Richard Hart and George Hole teach in departments of Philosophy; Gene Beyer and Samuel Mudd, in departments of Psychology: Donald W. Hinrichs in Sociology, and Linda L. Burroughs in Biology. Most of these college faculty members describe academic tasks designed to engage students in reflection on their own lived experience, including that of the college classroom.

Included in this section, too, is a paper by Vera Goodkin describing an approach to faculty development in critical thinking across the disciplines, in which faculty in such diverse departments as Allied Health, Engineering, and Criminal Justice developed techniques to engage students in active educational experiences.

Hart, in *Critical Thinking and Ethics,* cites Harvey Siegel's discussion of critical thinking as a foundation for understanding in any area of inquiry. In proposing ethics as "a species of reasoning," with its own goals, materials, and methods, Hart defines ethics as a "process of valuing . . . activity that builds upon life experience and the immediate practical context as it seeks relolution of fundamental moral questions and dilemmas." Critical thinking, and the reasoning skills associated with it, he proposes, "constitute the engine that drives ethical deliberation forward."

Hole's paper, entitled *An Experiment: To Make Your Life More Meaningful,* describes an exercise in "self-initiated change" through which students would, it was hoped, "gain a better understanding of critical thinking by applying it directly to their lives," in the sense of "using critical thinking as a tool on their world by using it reflexively on themselves." Students engage in planning and executing personal experiments in change, as well as reflecting at each step on the underlying "essential, universal, or philosophic" questions raised by the change effort. For example: a change effort to lose weight raises the underlyng question "What is beauty?" Rich material for insights into the nature, value, and problematics of critical thinking, especially because of its collision with personal opinions," Hole reports, result from this exercise, as well as practice in wrestling personally with the Socratic dictum " the unexamined life is not worth living." He reports, too, that many students progress beyond relativism and nihilism as they reflect and act on their chosen experiment.

Like Hole, Linda Burroughs, in *Critical Thinking in the Hard Sciences: The Missing Skills*, describes an approach to the teaching of critical thinking within her discipline-in this case-biology, by engaging students in the process of inquiry within that discipline. She suggests a number of activities to engage students in the scientific process of empirical inquiry as well as reflection on that process, rather than the memorization of scientific facts.

In *"Psychology of Creativity:" A Course Involving Relationships Among Critical Thinking, Creative Thinking, and Pedagogy*, Beyers states that both "creative and critical thinking involve an active questioning stance toward experience, a willingness to suspend habitual, conventional perspectives and the acceptance of contexts as given; that is, adjusting to situations uncritically." Like Hole's students, those of Beyer work on a "problem" of their own choosing, reflecting critically on the process. Beyers, too, as professor, engages in reflection on the educational process, sharing the results of this inquiry with his students.

Samuel Mudd, in *The Exigetics of Graphs: Call for a Pedagogy*, focuses on the role of graphic representation in the process of critical inquiry and problem solving, with an emphasis on introducing students to interpreting information compressed into graphic form. By "exigesis," he refers to the "interrogation of graphs for the purpose of understanding more fully the processes they represent." Such interrogation, he suggests, should be done in "classroom interaction, where students are challenged to visualize hypothetical changes in process in terms of corresponding changes in the graphs, to indicate consequences for the process represented by changes introduced into the graphic figure."

Hinrichs' paper,*Teaching Communication Skills in the Context of Introductory Sociology*, provides a rationale for the development of critical thinking abilities through the development of communication skills within an academic discipline. The goals of undergraduate sociology instruction transcend sociological content. According to Hinrichs, critical thinking and skills in gaining and extending knowledge are also among these goals. Communication, Hinrichs notes, is "socially and psychologically critical to the development, self- concept, and everyday interaction of the individual within a social context." Hinrichs describes a "sociolinguistically sound" pedagogical approach toward the development of thinking and writing that involves initial small group discussion of a critical social situation, followed by the preparation of memoranda from the perspective of a participant in that situation (e.g. a panel of citizens with a decision to make). Students then compare their different perceptions as reflected in the memoranda, and reflect on the process as well.

In *Critical Thinking: Language of Inquiry in the Disciplines*, Vera Goodkin describes a collaborative faculty development project at a community college which began as an outgrowth of a previous project involving writing as a tool for thinking and learning across the disciplines.

Strategies were developed to require active participation in learning activities, with requirements such as field trip reports, reaction papers, film critiques, and questions for discussion of controversial issues.

Critical Thinking and Ethics

Richard E. Hart

1. Introduction

My varied experiences, over many years, of teaching courses in ethics has led me to the conclusion that the activity (or skill) variously and broadly referred to as critical thinking and reasoning, problem solving, or dilemma resolution, is the modus operandi of ethics as a discipline. Simply put, for me, as a philosopher/teacher, such a view provides the most fruitful way of approaching ethics philosophically. In what follows I shall try to make my case, elaborating on how and why we need to question our presuppositions regarding the nature of ethics, and arguing for the notion that ethics is basically a species of critical reasoning. My conception echoes the general position of Professor Harvey Siegel in his keynote address to the conference, namely, that critical thinking, in a generic sense, constitutes an important foundation for understanding in any discipline or area of inquiry. I wish to demonstrate the truth of this claim within the particular realm of ethics.

Basic inquiry in ethics, and my beginning courses, always begin with the question, "What is ethics?". Initially, most students are confident in answering that ethics is definable in terms of societal codes and laws, parental teachings, religious directives, personal preferences, or various combinations thereof. For me, this has two questionable implications: one, what I characterize as a static, product view of ethics, namely, that ethics is "something" that is resident "somewhere" and "passed on" from one person, one generation, to the next; and two, that ethics is hopelessly lost in subjectivity or untested opinion, what I sometimes call vicious, negative relativism. Both implications are dangerous, unsupportable, and spell endless dilemmas and confusions for the field of ethics.

I propose a radically different view of ethics to my students. Ethics, as a domain within philosophy, is in fact a species of reasoning, one which, of course, has its own unique materials and goals. Reasoning in architecture, for example, uses materials and processes such as drafting, blueprints, construction products with the goal of designing a structure that is durable, efficient, and aesthetically pleasing (hopefully). Reasoning in ethics uses its own specific and unique materials--principles, concepts, distinctions, experiences--in seeking the goal of an individual human being making informed, responsible, and defensible moral decisions. In short, ethics is not a code, a dogma, something to be found somewhere in a book, something to be given to someone like a gift. Ethics is a process of valuing (a verb), an activity of the mind in concert with the heart, activity that builds upon life experience and the immediate practical context as it seeks resolution of fundamental moral questions and dilemmas.[1]

This conceptualization of ethics can, in part, be illustrated by two diagrams that students and I find useful. I routinely employ them in the first class sessions of each new course. For purposes of this essay, I consider them to be basically self-evident, though they require considerable detailed elaboration with beginning students.

Diagram One

Ethics is:

Nature and function	**Goal**	**Materials**
a species of reason philosophically sound reasoning	arriving at thoughtful, conscientuous, justifiable moral decisions	concepts, distinctions, principles, patterns of argument, case illustrations, life experience

Diagram Two

Ethics (nature of)

a. descriptive aspect

goal: "is" and maybe "why"
field: social sciences
method: tests, surveys, experiment, comparative studies

b. legislative aspect (dogmatic)

goal: adherence/ conformity, "do's" and "don'ts"
field: religion, theology
method: conversion, obedience, fear, worship, salvation

c. normative aspect

goal: "ought", justification for one's decisions
field: philosophy
method: critical reasoning[2]

II. *Materials*

A carpenter requires a variety of tools and materials to do his work, to achieve his ends. Likewise, the ethicist requires unique tools and materials in pursuing the goal of defensible moral judgment and action. Such consist in numerous theoretical ingredients, each constituting in its own way the resources needed for critical thinking in ethics. I find these ingredients to be most effectively presented in terms of a) five broad themes, and b) what I call "a hundred and one specific items," which includes basic distinctions, concepts and principles. Below are two tables that illustrate what I have in mind. Space does not here permit, but in class each item requires both elaboration and a variety of examples.

Table 1

Five Broad Themes

1. Autonomy- the rendering of defensible moral judgment, indeed, the generic act of valuing itself, requires the independence of the agent. The decision maker cannot simply be a function of laws, customs, parental teaching, religious dogma, etc... This is not to deny that many such influences prevail upon the person.

2. Reasoning (moral philosophizing) - ethics is not static, but rather an ongoing activity. It is one species of reasoning, having its own unique materials, methods and goals. The auto mechanic, fashion designer, physicist, architect, like the ethicist, each display his own species of reason in relation to particular subject matters and problems.

3. Context - every ethical decision is rendered from within a context. A context is defined by numerous traits or attributes and every context is unique. Reasoning in ethics must take account of these specific traits if sound, realistic decisions are to be reached. Havoc in the realm of ethics ensues when it is assumed that a sweeping generalization (i.e. abortion is murder) applies without qualification to all conceivable contexts.

4. Rights and Responsibilities - two sides of the very same coin. Though tremendous confusion typically surrounds them, rights (natural, civil, moral, etc.) are a cornerstone of ethics. For every right legitimately claimed there exists a concomitant responsibility. For instance, the legal right to vote can be meaningful and make sense only to the extent that it becomes actualized in the regular practice of voting.

5. Justification - (based on facts, principles, arguments) - persons naturally seek justification for decisions rendered and actions undertaken. We seek conclusions that are cogent and defensible, that others can rationally comprehend even though they disagree. Importantly, justification is not arbitrary or capricious. It is the outcome of a reasoned search for the principles of human conduct, a search based on facts and evidence, grounded on the interplay between differing principles and arguments.

Table 2

A Hundred and One Specific Items

Basic Distinctions	Basic concepts	Basic principles (theories)
moral vs. nonmoral valuing	valuing-values	utilitarianism
descriptive vs. prescriptive	moral dilemma	consequential (teleological theories)
	intrinsic value	
is vs. ought	instrumentalism	non-consequential (deontological theories)
means vs. ends	free will-choice	natural law
absolutism vs. relativism	conditioning	divine rule
positive vs. negative relativism	happiness and pleasure	ethical egoism
	rights and duties	ethical universalism
needs vs. wants	justice	etc.
objectivity vs. subjectivity	a good will	
	etc.	
etc.		

As I have stated in another context:

> In ethics, as in all other disciplined areas of learning, students need a structure and background that orients their attention and in terms of which analysis and applications to life can take place. Studying various aspects of ethical theory serves as a tool for thinking more clearly and more expansively about concrete moral problems. But the worth of theoretical investigation is realized only when such considerations are applied to the hoped-for resolution of actual moral dilemmas. In essence, theoretical

> considerations are justly perceived as abstract and hollow when detached from problems that characterize life experience, while specific problems addressed without the aid of theory often result in hopeless ambiguity and uncritical acceptance of moral biases.[3]

III. Applications

The use of illustrative examples and case studies is crucial in facilitating the students' understanding of ethics and the relation to their life experience. It is, also, crucial in advancing the notion of ethics as a function of critical thinking. I have struck upon two fruitful historical examples that accomplish this dual purpose. The first is the dilemma of Socrates following his trial, as he confronts the reality of his impending death. His moral dilemma: should he accept the punishment of the state or should he listen to the pleadings of friends and family and flee jail even if it meant inevitable exile? His is a tremendous illustration of moral philosophizing, rooted in a specific setting, where principle clashes with reality, idealism flies in the face of practicality. My in-class interpretation of this famous historic example is greatly aided by the opening pages of William Frankena's slender yet insightful volume, *Ethics*,[4] wherein he seeks to introduce students to the nature of moral philosophy and philosophizing through the very example of Socrates confronting his doom, the philosopher whom he calls "the patron saint of moral philosophy."

The second example, rich with contemporary significance, is to be found in Martin Luther King, Jr.'s now famous "Letter from Birmingham Jail."[5] In this important document in the history of the civil rights movement, King seeks to defend his conduct in violating a Birmingham law regarding parade permits. In a challenging proclamation, he states that his actions were not only justified but obligatory. This leads directly into King's analysis of such things as just and unjust laws, means and ends, double standards in ethics, and difference vs. sameness. Whether one agrees with King's position or not, his "Letter" is an unquestionably clear and succinct account of the unfolding of moral consciousness. He skillfully leads his reader through the process of thought, the moral philosophizing, that establishes the credibility of his behavior, even though it was blatantly illegal.

Case studies, whether contrived or based on fact, provoke critical analysis and foster classroom debate. As such, they provide yet another type of practical confirmation of the process of critical thinking undergone by anyone lodged on the horns of a moral dilemma. As an example, consider the following case scenario that I sometimes present to students. The general structure and tone of this case was originally developed by the Center for the Study of Values at the University of Delaware. Following the scenario I offer some sample questions that illustrate how theoretical tools are applied to real-world dilemmas.

The Engineering Consultant

You are an engineering consultant to mining firms. Worldwide Mining Company hires you to evaluate one of their producing mines. You conduct the analysis and discover that Worldwide's mine has somehow moved under adjacent property owned by Ohio Mining Company, a much smaller firm. Worldwide clearly does not have mineral rights to the coal currently being mined.

You report to Worldwide Mining Company that, whether they realize it or not, they are infringing on the mineral rights of Ohio Mining Company. They thank you and pay you your fee for consulting. Six months later you discover that Worldwide is still mining under the same property and that they have not notified Ohio Mining of your findings. They have apparently done nothing with your report. Your contract with Worldwide provided that you would not disclose any findings to a third party. What do you do? What ethical considerations are involved? What ought you to do?

"The Engineering Consultant"

Sample Questions for Class Discussion

Five Broad Themes:

a. Autonomy

- Do you have to make a decision here on your own?
- Can you rely on someone or something else?
- What pre-conceptions do you bring to the case?
- How do you make your way to an answer?

b. Reasoning

- Describe the thought process you would undergo.
- How important are the facts of the case?
- Are there different ways of looking at the case?

c. Context

- What defining traits of this case are morally significant?
- What about the contract, the six month time frame, the fact that you've been paid, that you made an initial report?

d. Rights-Responsibilities

- Whose rights are at stake here?
- What kind of rights are they? Does it matter?
- Do you, the consultant, have any responsibilities?

-- How would you begin to define those responsibilities?
-- Are all the responsibilities obvious?

e. Justification

-- How would you, the consultant, seek to defend your decision and subsequent actions?
-- What priorities or principles would be at the top of your list?

A Hundred and One Specific Items

a. Is vs. ought

-- How do you think most people would respond to this case?
-- How do you think people should respond to this case?

b. Means and ends

-- Morally speaking, is it most important that you "keep your word", live by the rule, follow the contract?
-- Is it more important to bring about desirable consequences? To see that fairness is achieved in the end?

c. Egoism vs. utility

-- Should you, the consultant, protect your own personal interest above all else? Why?
-- Should the well being of a larger group of people (beyond yourself) be the principal concern?

d. Moral Dilemma

-- Is there a genuine dilemma here in this case?
-- Are there competing senses of obligation or duty?

IV. Conclusion

The nature of ethics, as a disciplined form of inquiry, cannot be understood singularly in terms of its tools, objectives or examples of dilemmas. All such factors have to be integrated to form a whole picture. This "whole pictures of ethics" confirms that the apparatus and functions of critical thinking and inquiry in the realm of ethics are not separable in practice. 'Indeed, critical thinking, and the skills associated with it, constitute the engine that drives ethical deliberation forward. To think of ethics simply as acculturation to one's society , as conformity to God's wishes, as pursuing narrow self-advantage, is to render it rote and lifeless.

Contrarily, to envisage ethics as an extension of critical thinking is to certify its proper and natural home in the course of human affairs. Ethics, like every other form of problem solving, emerges out of reason. And nothing should be more natural to the human being than reason and reasoning, for, as Aristotle postulated 2500 years ago, man is, in the most essential sense, the rational animal.

Endnotes

1. My understanding of the "active", "valuing" dimension of ethics has been enhanced by an important, but presently ignored, book by Evelyn Shirk entitled *The Ethical Dimension* (New York: Appleton Century Crofts, 1965).

2. Critical reasoning, as the methodology of normative ethics, involves such things as the following: a) analysis of the context, including all traits relevant to ethical evaluation, b) the casting aside of biases, c) testing standard assumptions, d) comparing and contrasting different ethical principles and arguments, e) application of principles to cases in an effort to reach solutions to ethical dilemmas.

3. Richard E. Hart, "Teaching Ethics", *AITIA*, Vol. 11, No. 1, Fall 1983, p.11.

4. William Frankena, *Ethics*, New York: Prentice Hall, 1963, p. 1 ff.

5. "Letter from Birmingham Jail, April 16, 1963", included in *Why We Can't Wait* by Martin Luther King, Jr., New York: Harper and Row, 1963.

For a useful treament of King's "Letter", cf. Vincent Barry, *Applying Ethics: A Text with Readings*, Second Edition, Belmont, CA: Wadsworth, 1985, pp. 2-4.

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An Experiment: To Make Your Life More Meaningful

George T. Hole

For the past seven years I have assigned a simple but powerful exercise in all my philosophy classes. The original inspiration for it was my undergraduate education in physics and my lingering envy of the physical sciences for their tangible results through the use of decisive experiments to test theories and hypotheses. My basic idea was to structure with critical thinking a life change that a person was already considering. I called the exercise "An Experiment" to emphasize differences with what I supposed was usual thinking about change. I added to the title, "To Make Your Life More Meaningful," to encourage more careful thought and satisfaction in regard to an appealing, but not always consciously explicit ideal, of meaning. I hoped that students would gain a better understanding of critical thinking by applying it directly to their lives, as well as gain benefits from the life change itself. While I have no "hard" evidence, I am confident that, based on the responses of my students and others, the results of the exercise are personally and pedagogically worthwhile for students, often dramatically so.

The experiment for many students does function like a decisive experiment in the sciences, except that the "theories" or "hypotheses" they are testing are usually not known, if at all, until the experiment is already underway or finished. Most students rate their experiment the best assignment in the course; each semester a few thank me for initiating a profound change in their lives. Overall, the experiment provides rich material for insights into the nature, value and problematics of critical thinking, especially because of its collision with personal opinions. I must admit, revealing something perhaps significant about us as critical thinkers, that, in spite of my students' great appreciation of the experiment and my confidence in it, I am not aware of any of my students ever trying the experiment again on their own initiative and I regrettably do not often do an experiment along with my students. Evidently, there is resistance to the experiment, too.

Early in the semester, after they have completed one or two written assignments practicing critical thinking, I introduce the experiment. It both excites and dismays students. Change, self-initiated change, is enlivening insofar as it involves deliberations about options, dangers, and hopes about one's place and meaning in the world. To engage in fuller deliberations about self-initiated change is often novel and always exacting. Students are instructed to answer a series of specific questions about one change they would be willing to make in their lives. I suggest a time frame of two to five days for them to reflect on the changes in their lives they are mulling over currently. They are then asked to choose one and implement it for at least two weeks. The change should be something that requires more than one action, such as telling someone off and walking away. The last week should be reserved for reflecting on and writing up their results according to the assignment hand-out. The first two items on the hand-out are:

> 1a. Make a list of changes you would like to make in your life. Choose one behavior, attitude, action, situation, or feeling, such that if you change it you will more fully realize the meaning in your life.

(If students are uncomfortable about disclosing the list to me I waive this part of the assignment.) Clearly, what students put on this list and why they choose the particular change they do can provide more material for self-reflection, as other items in the experiment also can.

> 1b. Design an experiment that you would be willing to do to produce this desired change. Be specific: answer who?, what?, where?, when?, as well as how?

The next items in the assignment involve directed reflection on themselves and their understanding of how their world actually works. My guiding assumption is that, while all people make changes in their lives, rarely, based on my experience, are we systematic and thorough in thinking through the full meaning of our changes. Indisputably, at times, we should carefully think about changes, before, during and after we make them--though, again, we rarely do so. And, while all people make changes, we often delay and delay in making them. In contrast, the experiment decisively welds together thought and action, including awareness of the thoughts which are used to delay action. Accordingly, the next assigned items are:

> 1c. What obstacles or excuses do you foresee in carrying out your experiment?
>
> 1d. What risks are involved?
>
> 1e. What motivators do you have for succeeding in your experiment?
>
> 1f. What results do you foresee?

The last item to complete before actually engaging in the experiment invites reflection on the interplay of theory and practice, the abstract and the experienced, philosophy and common sense:

> 1g. What more essential, universal, or philosophic question are you engaging in your experiment?

Students easily find "big questions:" "am I free?" " how does a person know what is right to do?" "why be truthful if lying pays?" Of pedagogic importance, the students now have a stake in their questions, plus a structured experiential route to begin answering them. Questions are not just abstract philosophical ones which are too easily debated or dismissed. Often, rather than the student having a question, it is more accurate to state that the question has the student. Thus, a student who does not feel he has answered his question satisfactorily does nonetheless develop a new relation to his question by becoming less reactive or ignorant of it. In general, students feel more responsible or autonomous from deliberately engaging in a change and in the more essential question it raises for them.

The rest of the assignment is:

2. Describe, briefly, how your carried out your experiment.

3. Evaluate your results, actual and anticipated ones. (Try to make your criteria of evaluation explicit.)

4a. Based on your experiment, what position do you hold with respect to question #lg?

4b. What insights, generalizations, theories, (or questions) have you gained about yourself, the meaning of your life, or experimenting with change?

Another unique, dimension of my classes may also contribute to the intensification of the experiment, so that students' experiment-change is approached quite differently from their usual self-initiated life changes. I ask students to create a metaphorical mirror for self-knowledge so that they can check their philosophical image just as they readily check their physical image in a physical mirror. The mirroring device I ask them to use is the periodic group recitation in class of statements which, with some misgivings, embarrassment and subterfuge, I call "vows." I ask them to recite and then be mindful of their reactions to reciting three vows. The vows are "to question," "to be honest with myself;" the third depends on the subject of the class, for example in the Philosophy of Love and Sex class, the third vow is "to be more loving." I explain to students that I do not care if they commit themselves to these vows; only that they be mindful of their reaction to them. If they think the vows are silly, fine, then that is their reaction. Over the semester their reactions give them personal information to note and reflect upon, which is often compelling information about discrepancies between what they say and how they have recently acted. The vows, I suspect, add a background of seriousness to the students' experiments, in addition to sometimes coaxing into the open a personally worthwhile subject for experimentation.

Many of the changes students propose might seem mundane.

Students in my Introduction to Social and Moral Philosophy classes frequently choose to lose weight (mostly female students) and to exercise (mostly male). However, the context for the change, a philosophy class in which serious vows are at play as well as the directives for self reflection, particularly #lg. about a more philosophical question, enlarge the character of the change. Consequently, even initially mundane appearing changes lead to significant discoveries. For example, students who choose to lose weight consider for their "more philosophical question" a question like "What is beauty; Is it just a matter of physical appearance?" Other typical proposed changes involve becoming more honest with parents, friends, or lovers. The nature of the class shapes the proposed change. In my Existentialism classes many experiments involve a change toward authenticity. In my summer course Philosophy of Love and Sex, as would be expected, students choose to improve a love relation. In a few instances students experiment with sex; usually females refrain from sex with their male lovers until they (the males) become more communicative or committed.

In a few instances I receive mistargeted experiments. In spite of warnings to the contrary, some students experiment on other persons without their knowledge or consent, instead of choosing themselves as the primary subject of change. For example, a male student experimented by "allowing himself to be seduced," then questioned his seducer the next day about why she did it. Along with his written work, he was proud to hand in a tape recording of his telephone conversation with her in which, for the few minutes I listened to it, he tried to get her to admit her "bold" sexual actions and her reasons for them--while his friends were listening and laughing in the background. Clearly, there are risks in assigning this experiment.

Among the problems this mistargeted experiment raises is the minor but chronic question of grading: How should an assignment apparently so personal and non-academic be assessed? Except for two comments, I shall duck this question because grading is a large, separate, issue for all assignments--and gradability alone should not determine the worth of them. Comment 1: I do not get complaints from students about grades on their experiments, because, perhaps, they find them intrinsically rewarding and my grades on this assignment tend to be higher. Comment 2: I try to direct my comments on the quality of critical thinking demonstrated. Yet, with mistargeted assignments, and others too, I raise questions in the margin that certainly go beyond the "formal" quality of critical thinking; they are aimed at the content of students' values. With the "seduced" student I wrote questions on his paper like "How did your awareness of friends listening in the background affect your questioning of your 'seducer'?" and "How would you react if you discovered that you were the subject of an experiment without your consent?"

Except for one comment, I shall also duck the question, which goes to the heart of philosophy, of whether I should write substantive questions in the margin to direct students to the content of their values so that they can explore them in more depth and detail. Not only should students know how to use critical thinking as a tool on their world, they must also employ it reflexively on themselves. Self knowledge is not the only reason for using critical thinking reflexively. Only by applying it fully and intimately can they finally assess the strengths and limits of critical thinking.

I hope my comments provoked the "seduced" student to do some reflection on informed consent and ridicule. Perhaps he only reacted with surprise and defensiveness because I was not in agreement with his attempt to expose his seductress--even that reaction, I hope, would provoke some small reflection. In a less obvious way, most experiments raise concerns about informed consent and ridicule, though only a few students become aware of them in the course of their experimenting. Informed consent, recently and increasingly crucial to medical decisions and participation in psychological experiments, is applicable to the students' experiments in two ways. First, because of my authority and grading power, I may be seducing or subtly coercing my students into a course of action, potentially dangerous, without fully informing them of the consequences of their compliance or without giving them the option to refuse doing the assignment. Second, even if the experiment were fully explained, are they in a position to consent responsibly to what could precipitate a crisis and profoundly change their outlook in their lives? Even if I explain and warn them based on past students' experiments about risks of applying critical thinking to their own cherished values, I am not sure students or I can assign any meaningful value to the risks involved. While it may be overly dramatic to put it this way, the experiment more than any other class activity forces students to wrestle personally with the Socratic dictum, "the unexamined life is not worth living." They begin this vexing task without realizing beforehand what they are getting themselves into.

To appreciate this claim about the experiment and the unexamined life, consider ridicule, the subject of my other marginal comment to the "seduced" student. Ridicule, whether it is the stereotyping and attacking of others or oneself, creates formidable barriers to making changes, especially changes which involve incisive examination of one's personal or group values. Self-ridicule shows itself in defeatist excuses (item #lc.), like "I am a lazy s.o.b. for not being able to change" or "while I would like to change, my parents would be ashamed if I did." More subtly, ridicule may show itself in a resistance to doing quality critical thinking about one's basic values: for example "I do not have to think about what I know in my heart." In the language of critical thinking, ridicule, like all emotions, embodies charged assumptions we hold about our worth and place in the world in contrast to others' worth and place or in conflict with their assessments of our worth and place. Like any powerful and disguised assumption, it is difficult to identify and then get distance enough from emotions so that one can assess the truth of their embedded ideas.

Essentially what the experiment provokes for students--which for me raises questions about the risks and moral limits of challenging others to question deeply--is the collision of critical thinking with deeply held personal beliefs. Students, of course, know that questioning can lead to doubts, uncertainties, and even loss of belief, and it can lead to conflicts with authority, tradition and inherited belief. And, most threatening, it can lead to a profound personal crisis. Like many truths they know, they know them mainly on authority, in this case, my discussions about the dangers of doing philosophy without sufficient first hand challenging experience with critical thinking. They do agree early in my courses that none of the following, either alone or jointly, warrant justified belief: the strength, sincerity, comfort or familiarity with which the belief is held, or the agreement of others with it. They also agree that rationalizing or ignoring are not justifiable substitutes for examining values, particularly not justifiable sustitutes for examining difficulties in them. With regard to others' values and abstract, non-personal philosophical issues, they can safely avoid testing for their own substitutes for justified belief and they can also avoid testing for their substitutes for honest, open, courageous inquiry. The experiment, like no other assignment, forces a test of their appreciation of the power of critical thinking, including the powerful troubles it can cause. As a result, many students come anxiously face to face with fears and guilts that hold one of their beliefs in place.

Inevitably, in the course of doing their experiments students find a puzzling and undeniable reality answering back, such as the hostile reactions from and to friends at a bar when a student stops drinking alcohol with them. They realize this dialogue, unlike many other applications of critical thinking, is dramatic, not just abstract or academic. They struggle for understanding and hoped-for results against a strong force field of comfortable, self-confirming, self-supporting, encapsulated opinions. In essence, they must struggle with ignorance, not ignorance simply understood as not knowing. With increasing awareness they suffer an ignorance of the kind that is a refusal to fully admit what they know or do not know. Thus, they achieve a Socratic ignorance; they come to realize about something that matters to them that they do not really know what they think they know. This hard-won ignorance makes inquiry real.

Two potential outcomes of critical thinking, relativism and nihilism, are modulated by the experiment. While students tend to be relativists before entering class, they can become more entrenched relativists when they see that there can be quality critical thinking supporting opposite sides of an issue. They think that they now have more reason for their conviction of relativism because even philosophical positions finally are a matter of opinion and everyone is free to have their own. Clearly, this view can thwart or distort any fair testing of critical thinking. Some relativism, I suspect, is cowardly in that it acts as a protective device for students to avoid advocating and defending beliefs which they strongly feel are right but fear opening to ridicule and rejection by fellow students. Doing the experiment softens their relativism. Students frequently discover that their own opinions are not as true or warranted as they believe and they are not as free to choose them as their relativism suggests. Fortunately, the beliefs which they discover are not true are mostly negative ones, like "you can never trust men (or women)" or "my parents (friends, lover) would never understand." But, with the rush of excitement from a successful experiment, a student will sometimes replace a negative belief with an overly optimistic one, the most frequent being "I can do anything I choose to."

Nihilism is the other possible outcome of critical thinking modulated by the experiment. Students acutely sense that everything can, in principle, be questioned. Nothing is sacred or immune from examination. Accordingly all values, including their own, can appear to be forms of vanity. The vulnerability of their values to critical thinking is, understandably, quite disturbing. Because it is disturbing, a few students automatically reject penetrating critical thinking or reject critical thinking about anything except what is safe for them. Not only is the content of their values under duress from critical thinking, so is their relationship to their values because of its perspective. Critical thinking seems to require that students step back and with the "distance," achieve a neutral, objective or depersonalized point for analysis and assessment. This detachment from their own values can be vexing and confirm relativistic ideas--all values look alike from afar--or can confirm nihilistic ideas--all values shrink to nothing from afar. Curiously, when students reflect and act on the items comprising their experiment they are drawn more into their lives even as they are being more analytical about them. Intimacy, not alienation, is the dominant feeling.

In conclusion, in their struggles to gain more meaning in their lives, the experiment allows most students to discover a greater measure of freedom, responsibility and autonomy. To the degree that they think and act with honesty, openness and courage, virtues so necessary for full critical thinking, they are usually rewarded both in their discoveries and in the hoped-for results of their experiments. In other words, they are rewarded because their inquiry is genuine. It is genuine in the sense that they venture into what is unknown for something that matters to them. Enough surprises and discoveries arise so that they have to re-examine and redraw their conceptual landscapes with the aid of a new and uncertain ally, critical thinking. Yet, in spite of the risks, they emerge with results that confirm the worth of the effort. Finally, they express their experiment ideas in a written form that is often more intellectually alive than their other writing assignments. Because the experiment stimulates and structures genuine inquiry it is both personally and pedagogically worth doing.

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Critical Thinking in the Hard Sciences: The Missing Skills

Linda L. Burroughs

Abstract

How sciences like biology, chemistry and physics are being taught has, for some time, drawn a closer look in search of an explanation for their difficulty and low success for students. With the supposition that knowing information does not necessarily translate into one's being able to apply or evaluate its ideas, a more process-oriented approach to learning has been developed in these areas. This process, i.e. being able to develop numerous conceptual applications from one concept, is part of the emphasis in teaching critical thinking skills. Other skills more fundamental (classification, inquiry, testing, synthesizing, application) have been found buried under a data base that, by itself, is rapidly out-growing a student's ability to contain. Yet these are the very skills that breathe meaning into the learning of scientific ideas, and have been largely replaced by recipe labs and multiple choice testing- Stimulus: Response knowledge without necessarily the ability of being usable. A brief presentation of key factors that should be reintroduced in any science course is made with accompanying techniques and verbal processing. These skills are meant to enhance course content, not replace it, by returning the control of the learning to the student as a user rather than a storer of information.

As everyone has at least one idea of what Critical Thinking should be, the workshop participants are asked a question:

> CRITICAL THINKING IN THE SCIENCES SHOULD ALLOW THE STUDENT TO_____ (they fill in)

Answers to this question vary from refined definitions of Bloom's Taxonomy to having the student problem solve. In fact, there are many more skills necessary for the competent management of science knowledge if the goal is new productivity.

> WHEN OUR STUDENTS ARE ASKED TO USE THEIR "DATA BASE" OF SCIENCE FACTS, THEY MAKE THESE MISTAKES (_____) AND RESIST BECOMING COMPETENT IN (_____).

Quickly discovered is that, while students can memorize data, respond to buzz words and appear knowledgeable when presented with several choices to select from, they fail to appreciate the same material if it is presented in a different mode, lacks accompanying choices, requires application of an idea or requires more than a superficial appraisal.

What lies at the bottom of their thinking rigidity? Why the dislike of sciences in general? Is this simply due to the difficulty of the discipline? I don't think so. As children, they had no fear of manipulating materials and, in fact, insisted on self-discovery. They were focused on the solution process, not the difficulty of the problem. We have taught our students to focus on "the right answer" rather than the process of discovery and self-correction.

If a true test of learning is desirable, what would you do? Change the conditions and/or expand the test modes. One fact surfaces each semester I teach: students do not realize all the ways in which they can help themselves to learn more thoroughly. To demonstrate ways in which students can be coaxed into trying out new ideas, participants are asked to engage in a question exercise. They list five words they feel represent their personality. Lists are exchanged with a partner. Information is solicited by asking questions. However, the questions can only be answered with a YES/NO format. The result of this depends on the group; but frustration, the need to explain a response and the inability to formulate questions will give way to a good discussion on how to most effectively gather data. The Questioner is asked to write his/her own interpretation next to the word under question. Very often the two participants find they have different interpretations for the same idea. Another useful conclusion!

A classification problem using a unit from Elementary Science Study, a process approach science program by McGraw-Hill, is very helpful in focusing students on their problem-solving strategies. "Norleys" and "Flubbyloofers" require only a few minutes time; but the harvest of insight gained by students in problem solving techniques and self-correction is long lasting. Not only do they have to find a solution, they must defend their written hypotheses with the proof before them.

We want empirical learners, yet we offer too much dogmatic learning. Science is supposed to produce empirical thinkers, ones who "rely on experience or observation alone without regard for system or theory; capable of being verified or disproved by observation or experiment" (*Webster's Dictionary*). Too often the students resist any attempt at interesting them in experimentation. Could it be that they do not feel the need to know? Science is supposedly "problem-oriented;" but what constitutes a problem?

(1) A barrier must exist between the situation and the desired result. . .

(2) There must be a desire to find a solution. . .

(3) And, one must believe it is possible to find a solution.

Without *each* criteria filled, no problem exists and the student feels no need to work on its solution.

How do we orchestrate learning so that it leads the student in the direction of "need to know?" We have all heard about the "AH-HA!" experience where someone has, by the process of trial and error, learned the right solution to a problem. They reached a point in their quest where they refused Instructor help. They wanted to "do it themselves." This, in my opinion, is the mark of a successfully designed teaching exercise. Is there some way in which confidence can be built in our students such that they will work feverishly on resolving the same project they would have avoided had it been assigned point blank?

Several items should be recognized by all instructors:

(1) There are several ways to achieve the same answer! Participants are asked to add the numbers 8, 6, 7, and 9. Individual methods are solicited. They all differ.

(2) Observation skills need training. After having been in full view of the audience for at least 45 minutes, I ask them to turn away and answer simple questions like, "What color is my skirt?" and "Am I wearing a watch?" on a piece of paper. When they are allowed to look once again, they are surprised at what they missed. Occasional sessions like this with students regarding anything from the walls in the classroom to the protozoans under the microscope will rapidly mature their ability to take in full detail and remember it.

(3) Create an environment where it is O.K. to fail. How many times did you have to practice shaving, hair-setting, writing, bow-tying, before you could do it well? Trial and error can be as instructive as it is vital for problem-solving.

(4) Attitudes favoring "acceptable" or "status quo" answers may rigidly exclude exciting alternatives. Shown a bizarre coffee cup with a long stem, too tiny handle and intricate etchings (from R. von Oech's book *A Kick in the Seat of the Pants*), participants are asked to judge the merits of said cup. They will invariably find it lacking if not useless. However, at some point, if pressed to recognize alternative uses, participants will soon discover that the "silly cup" becomes very functional.

Another way in which to pry learners from their zone of comfort is to have them make predictions. Using two beakers, which by appearance, are perfectly alike, have the participants predict the results of dropping an ice cube into the solution in the first beaker. They will give all the straight definitions of the properties of water (without any proof of its identity). Pressed, some may start inventing novel reactions from the mix. The instructor whines on about the "predictability and testability of the true science experiment." And so they are asked to predict the results of an ice cube dropped into the second solution. The results are not the same. But very few ever get out of their seats to investigate at close hand. They are waiting for the instructor to tell them what happened. Don't. They are to learn that using ONLY their eyes and assumptions does not constitute good science. If they leave their chairs and come smell, they'll understand.

Isn't it interesting that we teach with statement after statement, yet we test with questions? They are not the same. A statement can be very much carved in stone from the students' point of view. A question, on the other hand, has more open-ended possibilities. Several days after an activity with college sophomores in which they were to write questions regarding some research they were conducting rather than take notes on the facts, one student approached me with a news clipping. He stated that while he never would have seen this before, because he had written down a question regarding the topic, it caught his eye and was answered! Questions are very powerful. Thinking must not be allowed to stop at the point of delivery. Questions will keep new ideas churning.

Another way to drive the students to think for themselves is to respond to their question with one of their own. Careful not to discourage inquiry, this process can lead the students to develop confidence in their own answers without Instructor verification or, at least explore new areas in which to look. Are we not trying to move students towards an independent existence?

Several activities can be evoked to strengthen students' skill in developing questions from their notes, their study sessions and from the on-going lecture. One very successful activity is the Spider Web of Ideas. A central idea, word or concept is written on the board, i.e. pigment, aorta, or vector. Off-shoots are unlimited: connecting with the central theme would be any forms and functions, chemicals, physiological processes, anatomy, tissue types, chemistry or any details. These in turn will connect in many ways with each other. From this, questions can be seen forming from the inter-relationships and dynamics developed right before their eyes.

How can we tell if our students are not responding critically to the learning? There are some common problems students have in answering test questions that signal a lack of connectivity between the facts, superficial understanding and self-imposed restrictions on an answer:

1 - They may regurgitate in essay form without discrimination for what is really asked.

2 - They produce a Buzz Word response without having fully read the question; they list the most prominent fact they can recall without regard to its suitability.

3 - There's an inability to spatially manipulate ideas (especially in genetics) due to too many 8 1/2 x 11 pieces of flat paper being used for learning instead of real objects.

4 - They do not realize there can be more than one variable in a problem.

5 - If asked for specifics, they'll snow with generalities.

6 - They fail to look beyond ONE good answer when there may be a plural meaning applicable.

7 - They'll give a perfectly correct answer to the wrong question; they'll redefine the question to something they can answer.

If the ideas and skills fostering critical thinking are judiciously used to build their abilities to think critically about what they are learning, the difference will be very apparent. Students will not be running to you every moment asking for directions-they'll be correcting each other. And should you ask them if they require assistance, they'll probably say no; their confidence will run high, and the pleasure of self-discovery will in time promote more student-centered learning. Most importantly, their questions will change from "What am I supposed to do?" to "Can I try something new?"

The hardest part of teaching will become learning not to interfere. When students ask a question, don't direct them down the sure and successful path. Help them consider the various directions. With the skills taught them, they will be able to use your guidance techniques to seek answers when you are no longer around.

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"Psychology of Creativity:" A Course Involving Relationships Among Critical Thinking, Creative Thinking, and Pedagogy

Gene Beyers

I intend this paper as a framework for discussing how critical thinking might occur in a classroom and how we might think critically about this. A specific course "Psychology of Creativity" will be used as a means toward this end.

Both creative and critical thinking involve an *active questioning* stance toward experience, a willingness to suspend habitual, conventional perspectives and, the acceptance of contexts as *given*, that is, adjusting to situations uncritically. Assuming most people have critical and creative capacities, what does it mean to engage students in the pursuit of creative and critical thinking?

Additionally, I make the assumption that critical and creative thinking involve approaching a situation as a problem to be solved, for example, a course or lecture. Two important steps involved are (a) identifying the situation's elements and underlying assumptions and (b) acknowledging the importance of continuous questioning and critical reflection.

Therefore, the reader is invited to engage in "dialogue" with me. Each of us can look reflectively at our own ways of relating to the issues involved in this paper. Moreover, the relationships of reader and author to the paper's content parallel student-teacher relationships in courses we teach which are intended to engage critical thinking. So, one's stance toward issues raised in the paper may parallel stances we take toward issues in classroom teaching and learning.

Essential Considerations in the Construction of the Course "Psychology of Creativity"

Three Basic Assumptions

1. Critical thinking assumption: critical thinking involves identifying underlying premises, assumptions, and/or the perspective which frame an argument.

2. Creative thinking assumption: creative thinking involves identifying an unusual basis for a relationship between seemingly unrelated elements (ideas, objects, events, perspectives).

3. Combination assumption: critical and creative thinking, themselves, partake of an underlying similarity in their perceptual/cognitive perspectives, that is, assumptions 1. and 2. share an underlying base.

Course Units and Flow

The introductory session presents illustrations of what the course is about, content, and examples of how the teacher intends to present the course, its format. The parallel relationships between content and format and creative and critical thinking are suggested. Thus, I use the first session as a microcosm of the course.

Conceptual blocks: How routinized ways of perceiving/ thinking interfere with creative thinking

The text used in this first unit is Adams, J. L. (1986). *Conceptual Blockbusting* (3rd ed.). Reading, Mass: Addison-Wesley.

Assigned paper 1. requires a demonstration of students' ability to see blocks operating in their present, ongoing approaches to life situations. Students are asked to identify and characterize blocks in their own thinking. Thus, students are encouraged to take a critical approach to the relationship between their typical ways of perceiving/thinking and how these ways may interfere with creative thinking, that is, they are encouraged to question and see new relationships between present and other possible perceptual/cognitive processes. Students are encouraged to see this paper as relevant to their lives instead of seeing it as an obstacle to be overcome quickly. This paper, as well as the next one, is not graded but is judged by me as acceptable or unacceptable, and I give it extensive comments.

Biotechnology's impact on society–a simulation, and relevant news articles

I use a simulation/game (Franks, 1975) to provide an opportunity for students to see how some examples of problem-solving as a process may create new problems and unintended consequences.

A major purpose of this unit is for students to look at future consequenses of present choices when these decisions are based on different temporal perspectives (short vs. long range), and different social perspectives (personal vs. political, economic, social). I hope that this experience encourages critical reflection on the meaning(s) that follow from differences in how we approach issues and problems.

Additionally, students are given techniques and perspectives for generating unusual ways of seeing and thinking about self, others, and the world. These are methods that encourage students to approach given situations in an active, questioning manner.

During the above activities, students are assigned a second paper: to work on a "problem" of their own choosing, to present an account of their approach to the problem, and to indicate what they learned from their experience of that process. I expect this assignment to lead to critical reflection. The paper is due before the end of the course.

As the students begin their problem-solving paper, I, too, take on a similar assignment. I pick a problem from my life to work on and use it to demonstrate problem-solving concepts and processes. (Recently, I took as my problem how not to teach summer school.)

Videos, problem-solving and critical thinking.

In this last unit I integrate course meanings and demonstrate the relationship between creative and critical thinking.

At the onset of the unit, I encourage students to look for relationships among the content of the videos shown, how I use the videos, and the overall relationship of this unit to an assigned second text:

Watzlawick, P., Weakland, J., & Frisch, R. (1974). *Change: Principles of Problem Formation and Problem Resolution.* New York: W.W. Norton.

Videos 1. and 2. are respectively about and partially created by the artists, Red Grooms (1985) and Moses Pendleton (1982). Themes emphasized are:

(a) the artists' relationship to their art,
(b) art as process and integration of life and work, and
(c) the artists' reflection on themes (a) and (b).

The above videos are then contrasted with video 3.: *Anybody's Son Will Do* (1983) -- how a marine is "made."

Themes emphasized are:

(a) resocialization -- the process of remaking a "man,"
(b) the individual's participation in this process and the nature of his or her commitment (choice), and
(c) active vs. passive learning.

Video 3. and its themes are then compared with the next video in the series, *The Mormons: Missionaries to the World* (date unknown) -- a documentary on the training of young Mormon men for proselytization responsibilities. Themes emphasized are:

(a) the effects of socialization on identity,
(b) active vs. passive learning, and
(c) the nature of commitment/choice.

The last video in this sequence is *Changing Habits* (1986). It shows nuns who question critically their institutional socialization and the nature of their commitment to the Church and its hierarchy, that is, they question the context which shaped them and what it means to be a responsible agent. I use this video to integrate the themes of the previous four videos and examine their relevance to our lives as learners and members of society.

In summary, in this unit I use video in the following ways:

1. Each video and its themes are used as elements in an evolving argument which I make.

2. Extensive video use provides an opportunity for looking at TV critically.

3. I use the relationship of video program themes to our own socialization and identity. Herein, I hope students see that making this relationship requires an active, questioning stance toward TV *and* toward self, that is, to question contexts instead of accepting them as givens.

4. Lastly, I use video to demonstrate the Watzlawick et al. thesis on problem-solving and change. It is often necessary to get outside the usual context in which a problem is framed. Often, the problem turns out to be the way in which the person sees the problem. (The problem is not what the person thinks it is but how the person is solving the problem.) A new way of solving the problem would depend on a new way of framing it. And different ways of framing the problem change the context in which it is located. Therefore, Watzlawick et al. present us with a way of thinking about context, (what they refer to as levels). I use their thesis as a way of thinking about the relationships among self, schooling, creative, and critical thinking.

The last assigned paper in the course is a self-evaluation. At the course's beginning students are told to keep a journal consisting of efforts to use course ideas outside of class. Now, students are asked to look at their entire course efforts (including the journal record) and evaluate these efforts. The course grade is then based on a combination of their evaluation, my evaluation of their evaluation papers, their timely completion of class assignments, and whether they have met the required attendance policy.

In summary, I construct the course to reveal the relationship between creative and critical thinking through looking at (a) the context in which students and teacher interact, and (b) the relationships among learning, the self, and education.

Potential Relationships to Other Courses

To the extent that critical thinking is an important component of *any* college course, questions relevant to "Psychology of Creativity" may apply to other courses, as well.

I raise the following general question: What is the relationship potentially of the construction, constructs, and issues of this course to other college courses in which critical thinking is an important component?

Four groupings of questions follow.

Classroom Roles – Questions Regarding Behavior and Grading

1. Can (should) students be taught to question their usual student role? Will this result in a new role definition and new behaviors consistent with the course purpose of encouraging critical thinking? What happens if students do change from a passive stance toward learning to an active, inquiring stance?

2. What is the role of the teacher in critical and creative activity? How do we construct courses in which these kinds of thinking in both students and teacher are encouraged? What are the pedagogical issues involved? Are there inherent conflicts in the conventional roles of teacher/student that make it difficult for us to behave simultaneously in the classroom in an active and critical way?

3. What is an appropriate grading procedure in this context?

Courses in Context and Courses as Context

Additionally, I offer for consideration the following supplementary context characteristics:

(a) any college course, itself, exists in an institutional context (structure/frame), and

(b) the course structure, itself, is the experiential context for teacher-student interaction.

Therefore, critical thinking in a classroom can (should) involve seeing a relationship between content, what is taught/learned (and what isn't); and context, how that content is taught/learned.

Student Relationships to Courses

1. If students, by virtue of registration, are in a course which emphasizes critical thinking, what then is their relationship to how the course is structured?

2. What is the character of their participation in the processes and issues of the course?

For me, these questions point to the more general issue: How necessary is it for students to see the relationships within and between (a) what is taught and how the teacher teaches, and (b) what is learned and how the student learns?

If these relationships are important to critical thinking as a process, can students identify them and generalize them to other contexts? If they do so, then students are learning to take a critical perspective toward their own learning processes and toward the context in which they act and learn. As students learn to be critical, they may come to acknowledge the value of acting as learners who take responsibility for their own learning process. I hope that this is a key value in a liberal arts education.

Teacher Relationship to Courses

1. Is it necessary to share with students the process by which the teacher has constructed the course?

2. During course activity, does the teacher think reflectively about his or her thinking and behavior in the course?

3. Is it necessary to look at other potential ways of conceptualizing the course? and/or other ways of thinking about particular arguments and issues as they arise in the course?

For me, the value of this paper depends on its ability to provoke educators to think critically about what we do in the classroom. The issues raised are simultaneously theoretical and practical: How do we think about the relationship of critical thinking to education? In this spirit, I raise the question: If thinking is truly critical, does it need to be creative as well? Does the critical thinker need to look anew at the context in which learning occurs? And does the creative thinker need to look for underlying assumptions which inform the classroom?

As a college teacher recently quoted in *The New York TImes*, 6/19/88, p. 31, said,

> "At the University of Lowell, where I teach now, the students
> sit there and expect me to be responsible for their education.
> I actively resist that."

What forms do our resistances take?

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The Exegetics of Graphs: Call for a Pedagogy

Samuel Mudd

This paper is intended to draw attention to the place of graphics in processes of critical inquiry and problem-solving. In particular the concern is with the systematic introduction of students at the undergraduate level to graphic interpretation. The need for such an introduction is taken here more-or-less as a given.

First a general context will be set in the form of a brief review of major events in the origin and development of graphics. Then a sample of the use of graphs in solving problems will be presented. Next the existing research bases for a pedagogy of graphic interpretation will be considered. Finally, some graphic materials I have used to teach "graphic exegesis" to undergraduate psychology majors will be demonstrated.

Origin and Development of Graphics

Most writers agree that the invention of the device whereby a line in space represents the amount of some process abstracted from a conceptualization of nature can be attributed to the 14th Century French scholastic, Nicole Oresme (Clagett, 1968). Figure 1, taken from his Tractus de Configurationibus Qualitateu et Motuum published in the 1350's, was accompanied by the following text,

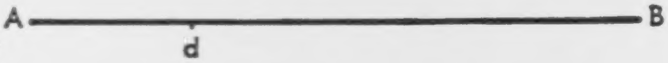

Figure 1. Point d represents a quality which, if regular in its change in intensity or quality, can be represented by the line AB. (Clagett, p. 195).

> "If, therefore, in the beginning of
> the motion the point d has a certain
> degree or some intensity and it
> continually remains in that same
> degree without alteration throughout
> the motion, then it will describe in
> line AB a uniform quality."

Earlier in the text (Clagett, 1968, p. 167) Oresme wrote about the intensive characteristic of objects, that "... the measure of intensities can be fittingly imagined as being infinitely increased in the same way as a line" (Clagett, 1968, p. 195). Figure 2 is a page from a hand copy of the original manuscript showing several graphs of complex multidimensional processes, what Oresme called composite difformity (Plate 9, Florence manuscript, Clagett, 1968).

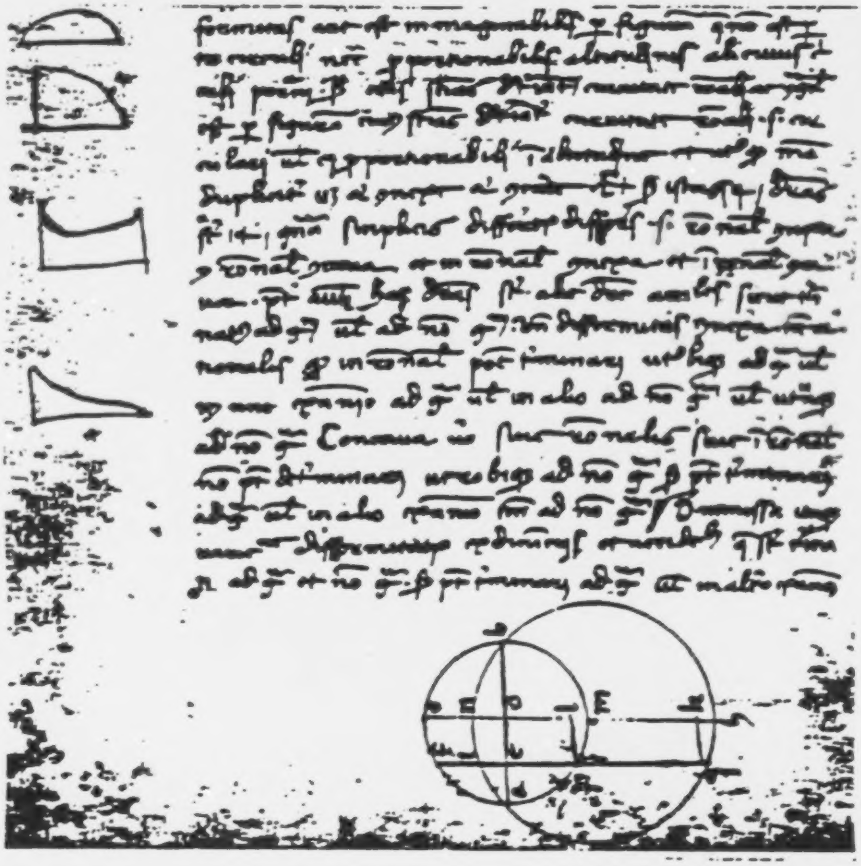

Figure 2. Left marginal graphs from Oresme represent non-uniform change in intensity or quality. (Clagett, Plate 9).

Such representations do not seem revolutionary to us; they are to us in fact commonplace. They are commonplace only because we have been brought up among them. Such figures have actually become so embedded in our culture that cartoonists, who rely on our stereotyped thinking and attitudes to set us up for their wit, can take advantage of that fact. Figure 3 from a recent copy of the The New Yorker illustrates this atypical rendition of a widely known aphorism. We are amused in achieving the appropriate exegesis of this graph.

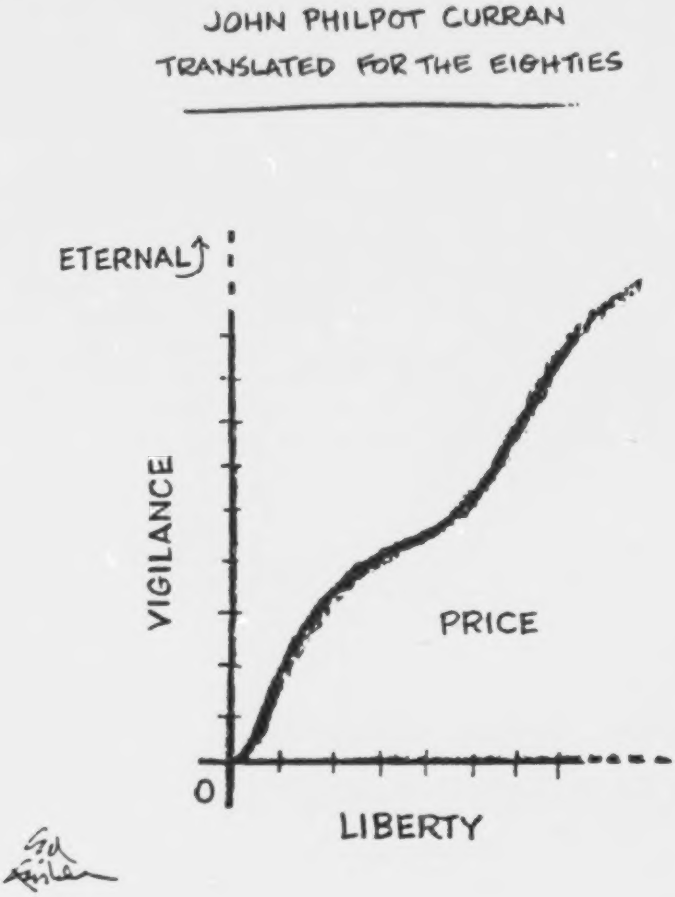
JOHN PHILPOT CURRAN
TRANSLATED FOR THE EIGHTIES
ETERNAL
VIGILANCE
PRICE
0
LIBERTY

Figure 3. Graphic cartoon: the price of liberty is eternal vigilance. (New Yorker cartoonist, Ed (*not legible*) Mar. 28, 1988, p. 86).

By the mid-19th Century, the use of graphics extended far beyond the areas of cartography, engineering and architecture into the fields of demographics and social history, to name a few. The recent work by Tufte (1983), The Visual Display of Quantitative Information, is a beautiful history of the technical evolution of graphs that is in and of itself attractive enough to grace a contemporary coffee table. Figure 4 shows a particularly striking representation by Minaud (Tufte, 1983, p. 41) of Napoleon's losses in the French invasion of and retreat from Russia in 1812.

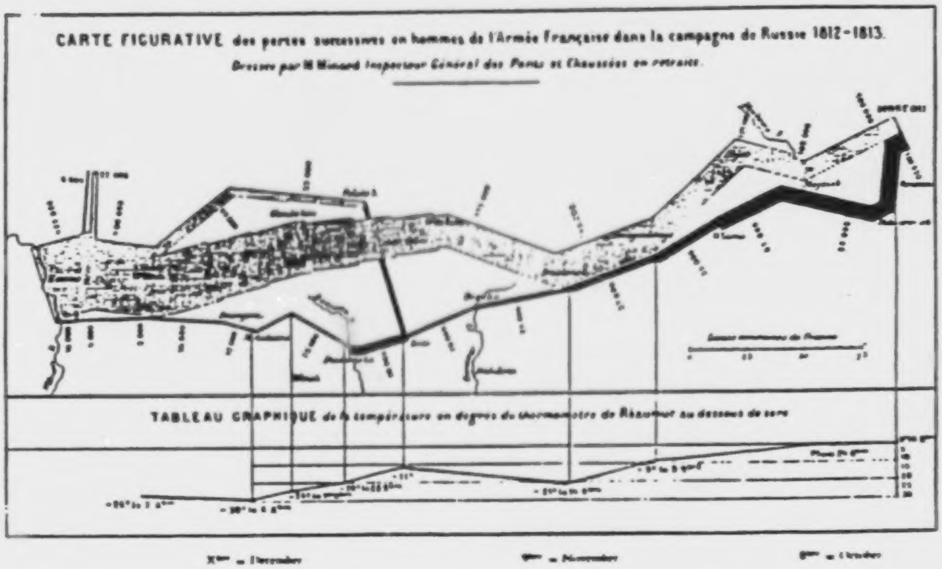

Figure 4. The famous Minaud graphic depicting the devasting losses incurred in the French invasion of Russia in 1812. (Tufte, 1983, p. 41).

An especially charming surprise in the development of graphics in the 19th Century was brought into the literature by Cohen (1984) who described the inventions of Florence Nightingale in the 1850's to move an otherwise implacable British Parliament toward much-needed reforms in military medical practice. Figure 5 shows one of her polar area diagrams. The "coxcombs," as she called them, are designed so that the area of the wedges is proportional to the percentage of deaths in the Crimean campaign from three general causes from April, 1854 through March, 1855.

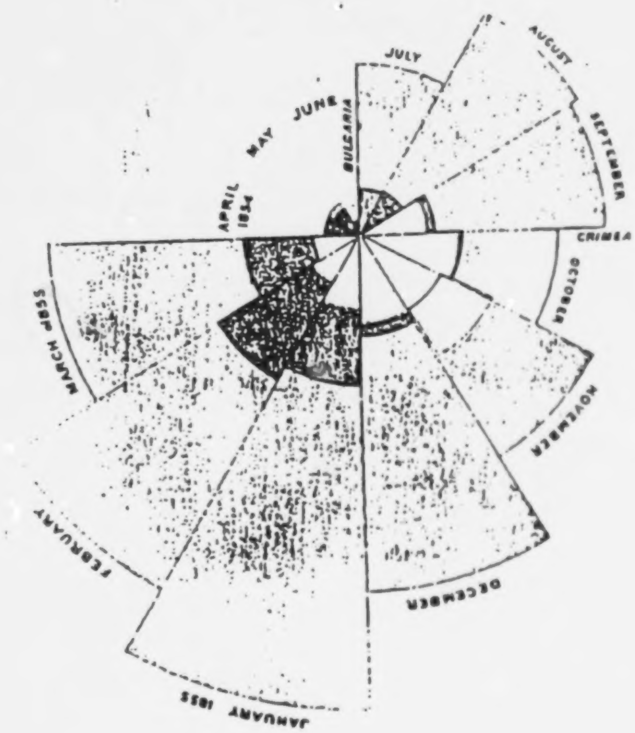

Figure 5. A sample of Florence Nightingale's famous "coxcomb" polar-area graphs (color not shown) depicting relative death rates among British troops in the Crimean War due to disease, battle wounds, and other causes (Cohen, 1984).

The major force in the evolution in graphics in the 19th Century, however, was due to instrumentation in the biological sciences where meaningful measures of physiological processes were translated directly into graphic representations. Figure 6 from Borell (1986, p.118) shows a splendid example of such an instrument, the kymograph invented by the great Helmholtz to measure the speed of the nerve impulse in frogs. Such direct analogue conversion of process to record launched graphics into the forefront of scientific analysis.

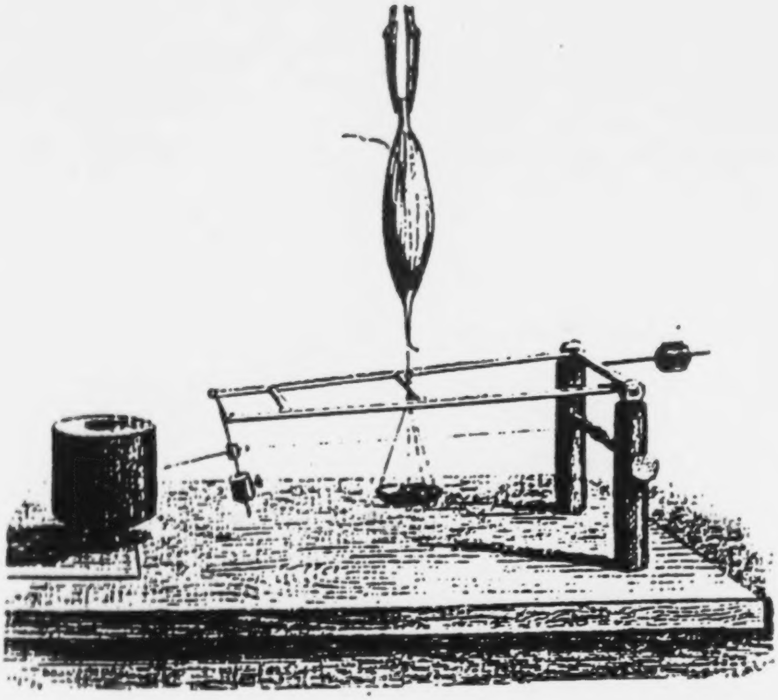

Figure 6. Helmholtz's Kymograph, one of the first instruments devised to convert physiological process (muscle contraction) directly to graphic form (Borell, 1986, p. 118).

Prior to such instrumentation, graphs were essentially analytic devices used predominantly by theorists in science to conceptualize abstract processes in a more concrete form. With the thrust of instrumentation, graphics gained an entry of its own into theoretical discourse in that pattern finding in the data, a theoretical goal, was found to emerge directly from a study of the graphic display. Figure 7 shows several examples of the sort of graphics that can be generated when such physiological sensors are converted to digitized, computer driven signals that can be analysed and displayed in real time. Such displays, taken from Hibbard, et. al. (1987), allow modern neuroscientists to move into the neural interior, first tapped at the level of peripheral nerve by Helmholtz, to probe in non- intrusive ways the deeper regions of the brain. The very graphs used to summarize known or hypothesized relationships among process variables in the early days are now in themselves the focus of the observations, namely to discover meaningful patterns in such dynamic displays.

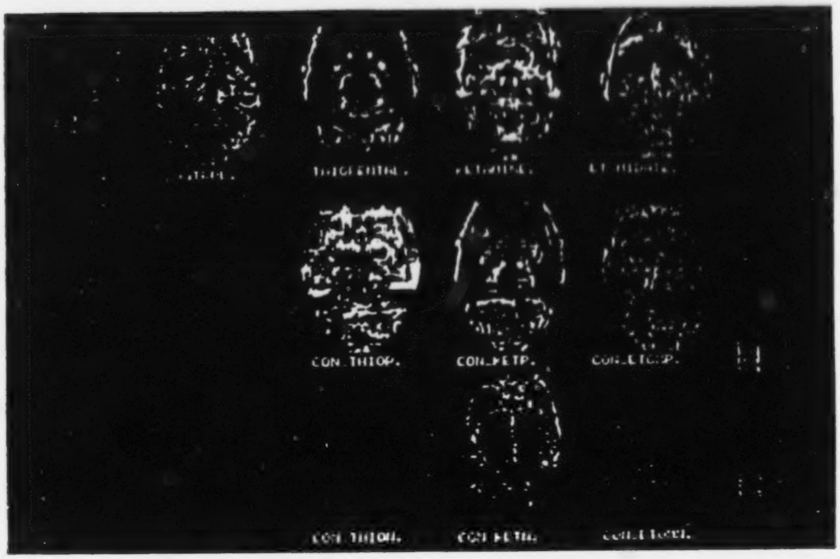

Figure 7. The graphic representation (color coding not shown) of the effects of different anesthetics on the metabolic processes in entact rat brain. (Hibbard, et. al., 1987, p. 236).

Graphs as Problem Solving Tools

Graphic devices have been a part of formal critical inquiry at least since the invention of circular diagrams by Euler in the 18th Century to teach a correspondence course in logic to a German princess (Woodworth & Schlosberg, 1954). Figure 8 shows the several possible relationships between two abstract classes X and Y.

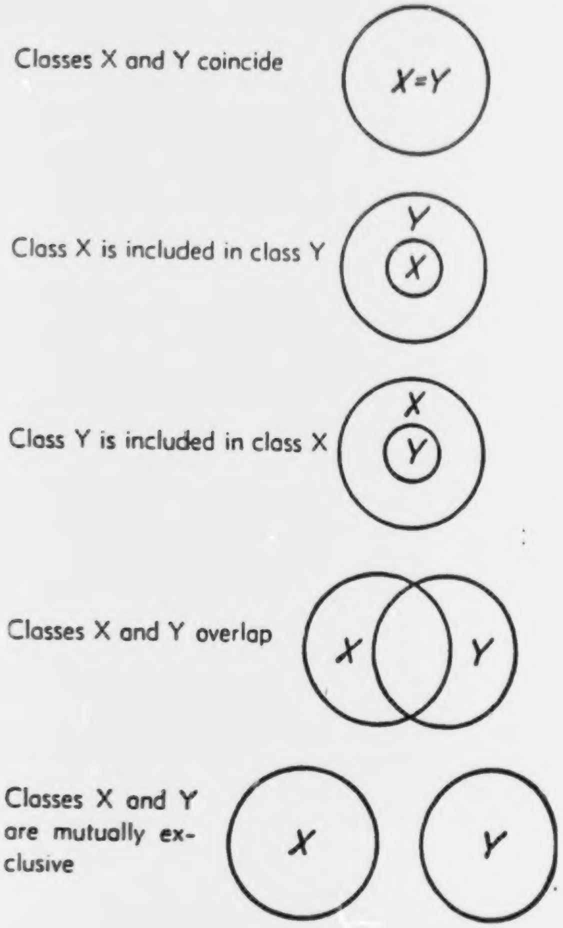
Classes X and Y coincide
X=Y
Class X is included in class Y
Y
X
Class Y is included in class X
X
Y
Classes X and Y overlap
X
Y
Classes X and Y are mutually exclusive
X
Y

Figure 8. Euler's diagrams to help teach the logic of sets (Woodworth & Schlosberg, 1954, p. 884).

These diagrams were subsequently popularized as Venn diagrams such as the one shown in Figure 9 which represents the relationships among three classes in a standard syllogism. This example was taken from a current introductory textbook in logic (Copi, 1982, p. 223) where the value of such diagrams in teaching logical problem solving is well established.

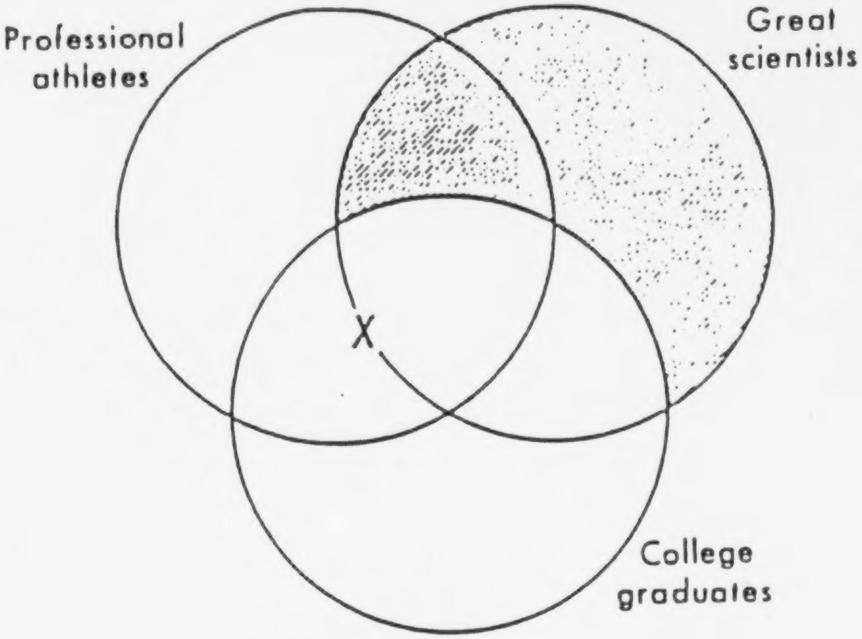
Professional athletes
Great scientists
X
College graduates

Figure 9. Venn diagram of syllogism found in typical introductory textbook in logic (Copi, 1982, p. 223).

More recently Simon and his associates at Carnegie-Mellon University (Larkin, McDermott, Simon, & Simon, 1980a; 1980b) have learned, among other things that distinguish physics experts from novices in the solution of problems in mechanics, that experts have a tendency to tackle such problems by first generating a sketch of the forces operating in the situation. Figure 10 shows a typical sketch accompanying the "think-aloud" protocols taken from subjects in their studies. Novice problem-solvers tended not to use such graphic devices; rather they began immediately to apply equations to the situation which often were not appropriate to the specifics of the problem posed.

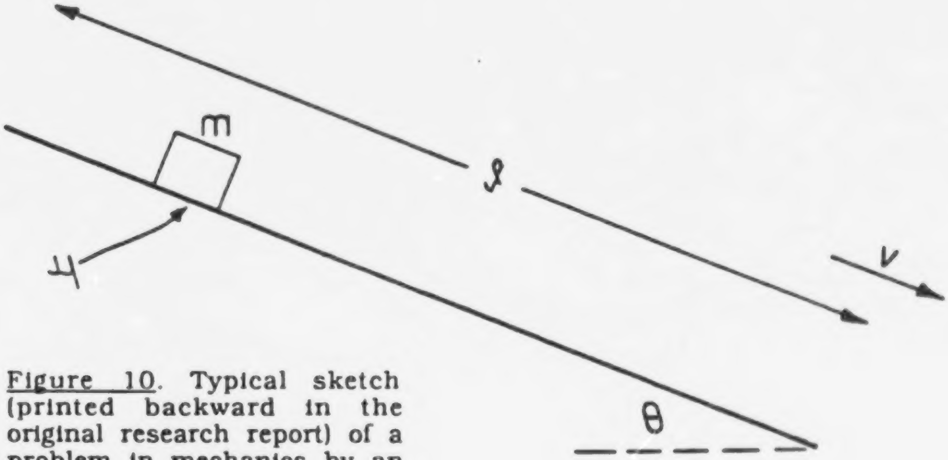

Figure 10. Typical sketch (printed backward in the original research report) of a problem in mechanics by an expert physicist. (Larkin, et. al., 1980a, p. 318).

The proven value of diagramming or, if you will, graphing certain types of problems, suggests that mental imagery plays a role in the solution of those problems. That has in fact been shown to be the case. There are emerging two bodies of research related to this issue of imagery and problem-solving. Both research fronts promise contributions to a research base for a pedagogy of graphic analysis.

Promising Research Bases for Pedagogy

The first body of research, opened by Warden in 1924 (Woodworth & Schlosberg, 1954, p.651), concerned the extent to which imaged mental representations contribute to problem solving. Warden's problem was a serial learning task (human finger maze) for which he found stable differences among subjects using motor cues vs. map-like images vs. verbal cues to learn a maze path.

Modern work along this line is represented by Hunt (1983) who found that some subjects used an image strategy in a sentence verification task as opposed to a verbal strategy. Figure 11 shows the difference in response times for the two strategies.

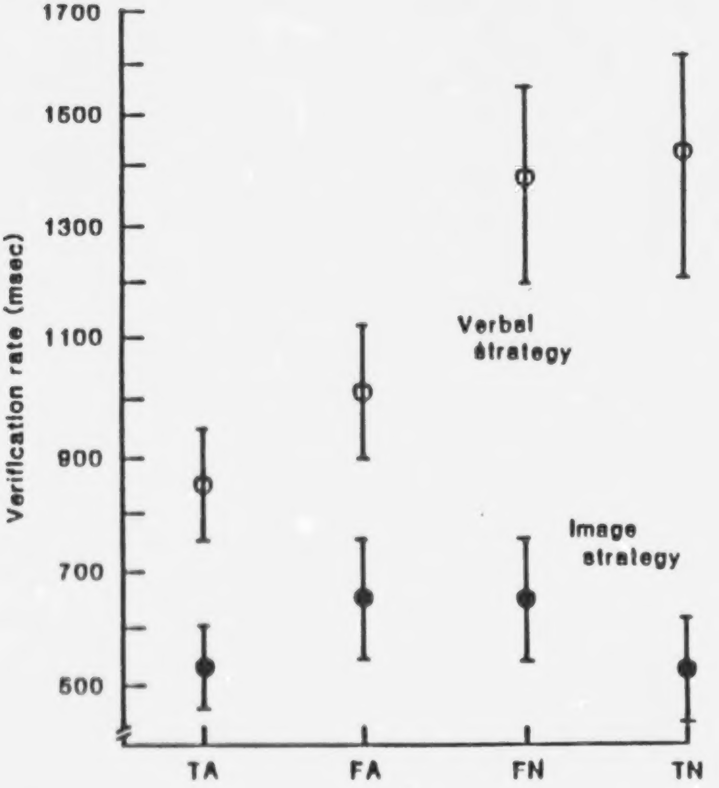

Figure 11. Data showing sensitivity of verbal sentence verification rate to verbal vs. image strategy. (Hunt, 1983, p. 144).

Fuchs and his colleagues at Oldenburg investigated the role of imagery in linear syllogistic reasoning using a Stroop-type interference task (Fuchs, Goschke, and Gude, 1988). Figure 12 shows that the two premises in the task were differentially sensitive to the interfering effects of imaged information incongruent with the verbal propositions constituting the syllogisms.

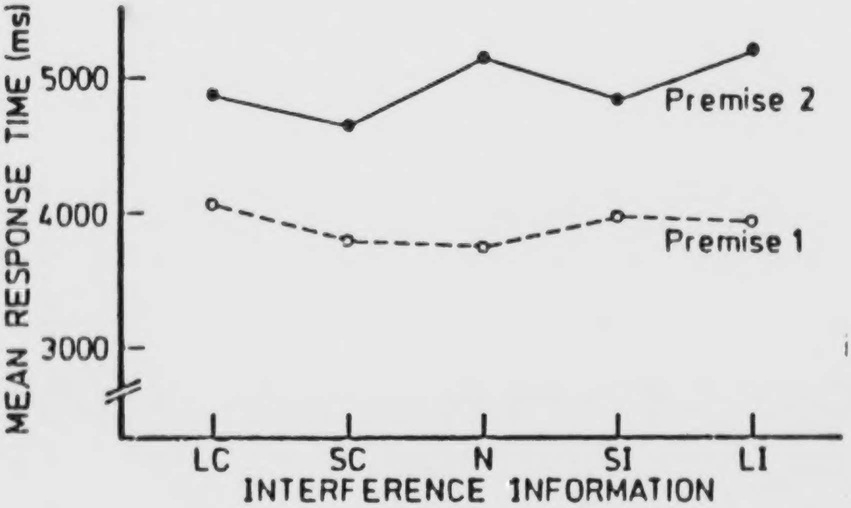

Figure 12. Research data showing differential influence of image interference (the Stroop effect) on one of the other premises in a verbal syllogism task (Fuchs, et. al., 1988, p. 47).

Such research is relevant to the exegesis of graphs to the extent that it sheds light on the facilitation or inhibition of inquiry due to the nature of the mental images triggered by the elements of the problem.

The second, more recently emerging, body of research relevant to a pedagogy of graphic analysis is represented by the work of Cleveland and McGill (1984). Those investigators are specifically interested in what they call "graphical perception - - the visual decoding of information encoded on graphs..." (1984, p. 531). In fact those researchers have set out to establish a scientific foundation for the "subject of graphical methods for data analysis and for data presentation" (1984, p. 531). Figure 13 shows the composite results of a series of experiments in which subjects judged percentage data represented by various graphic elements (element position, angle, etc). It is obvious from the graph that certain graphic elements, such as circle area shown at the bottom, incurred substantially more reading error than did elements such as element position (shown at the top of the figure).

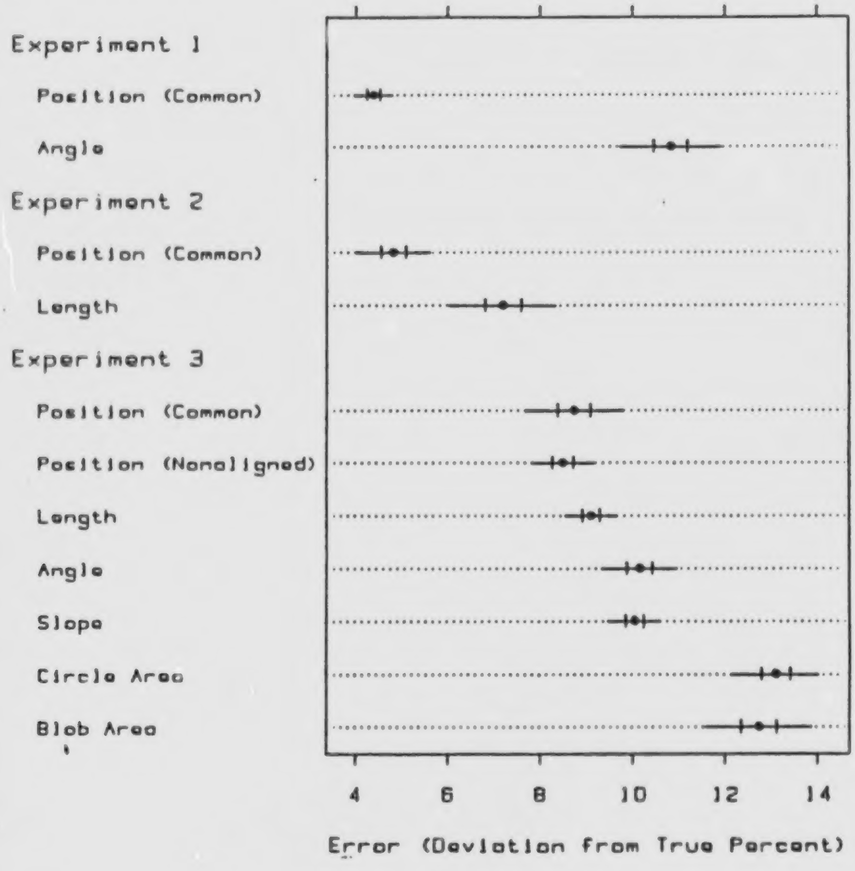

Figure 13. Summary of three experiments concerned with the specifications of the elements of the graph as they affect accuracy of interpretation of the figure. (Cleveland & McGill, 1984, p. 830).

Figure 14 provides a better feel for the sort of task that subjects were required to perform in those experiments. In this case the effects of X,Y axis proportionality were shown to contaminate judgments of the relative slopes of the two line segments (AB, BC) which, believe it or not, are identical in all three cases.

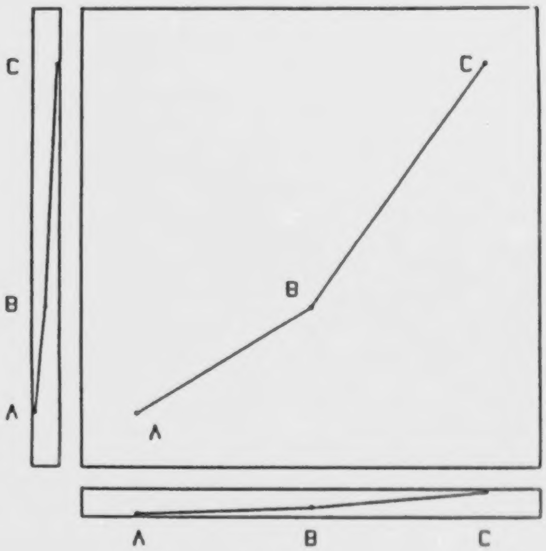

Figure 14. A specimen interpretation task from the Cleveland & McGill work (1985, p. 829).

It seems clear from the work of Cleveland and McGill (1984) that a scientific foundation for a pedagogy of graphic analysis is in the building. It is also clear that the work on the relation between mental imagery and problem-solving (Fuchs, et al, 1988; Hunt, 1983; etc.) has relevance for graphic analysis. Both lines of research can contribute richly to a pedagogy of graphic analysis that already exists in the rich teaching lore of practicing teachers, coaches, and supervisors on building sites whose responsibility it is to convert graphic and diagrammatic information into a realized product whether it be an action sequence on a ballet stage or football field, a new dwelling on a suburban building lot, or, in our case, a new understanding of some process in the mind of a student.

Some Exercises in Graphic Exegesis

In this final section of the presentation a few examples of "graphic exegesis" will be presented. By exegesis I mean the interrogation of graphs for purposes of understanding more fully the processes they represent. In my case the processes are those of concern in the area of experimental psychology as that subject matter is presented to those who are relatively new to the field. In all cases the interrogation is done in the form of classroom interaction where students are challenged to visualize hypothetical changes in process in terms of corresponding changes in the graphs, and, conversely, to indicate consequences for the process represented by changes introduced into the graphic figure.

Before this sort of exercise can be conducted, however, students must learn, or at least be reminded of, the basic conventions of graphs. This elementary process is analogous to what music educators call "learning the notes." Figure 15 shows an exercise my piano teacher, Mary Stasiak, uses to engrain the names of the notes in the scale to the keys on the piano. As a novice in his first piano book, I can attest to the value of this elementary exercise, the full scale value of which I still struggle to realize.

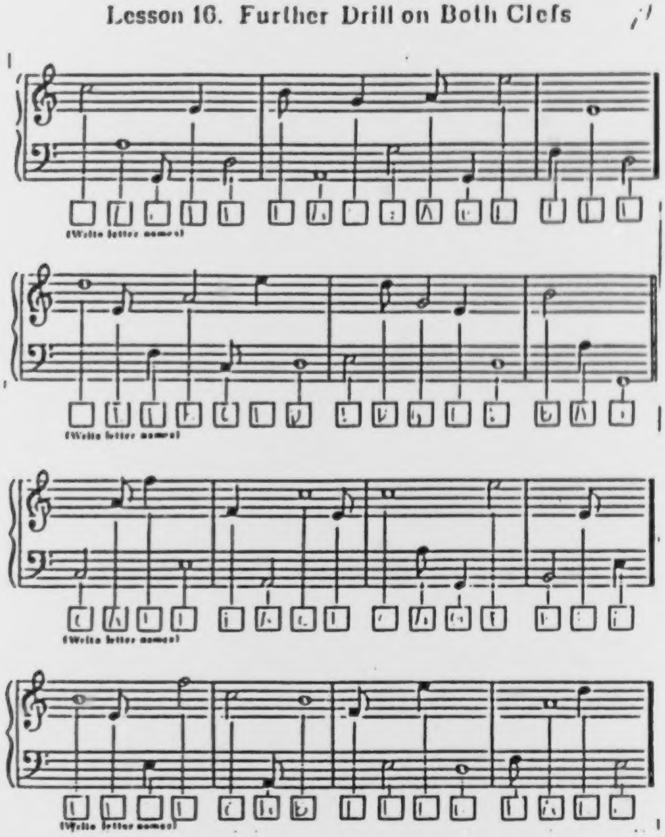
Lesson 16. Further Drill on Both Clefs
(Write letter names)
(Write letter names)
(Write letter names)
(Write letter names)

Figure 15. Learning the conventions of graphs is comparable to learning the notes in musical scores. (Mary Stasiak, piano teacher).

A counterpart exercise in graphics can be seen in Figure 16 which contains at least 16 violations of the publication standards for graphs of the American Psychological Association (American Psychological Association, 1983). The purpose of such conventions, of course, is to reduce the information processing load required in inspecting such figures so that the reader can focus on the unique information in the graph. The purpose of the exercise is to sensitize novice students to these conventions.

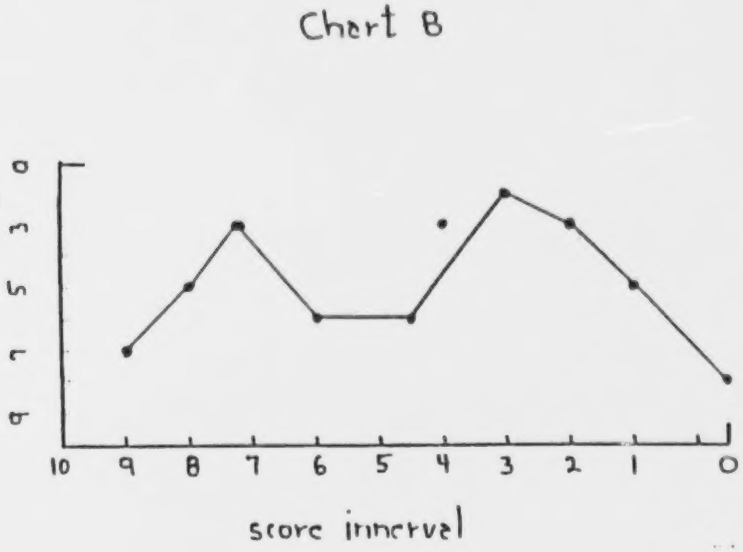

Figure 16. A test item to see whether students "know the notes" about graphing.

The three exercises to follow focus on an understanding of processes related to certain phenomena of sensation and perception. Figure 17, for example, shows the relationship between S, the amount of change in stimulation required for a human to detect an increase in sensation, for example in the brightness of a light stimulus. The graph shows that the amount of change required (**D** S) increases as a constant proportion of the initial level of stimulation. This psychological relationship is known as Weber's Law. The law is represented by this linear, graphic function. Once this fact is established, the class is asked to address various possibilities relevant to the sensitivity to light intensity of the perceptual system involved.

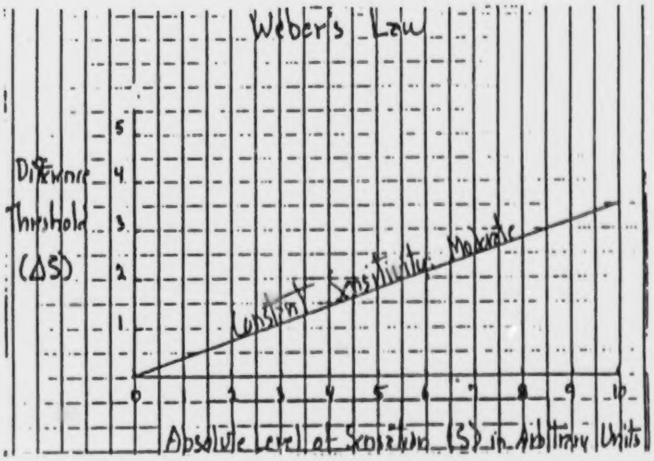

Figure 17. A tutorial graph of Weber's Law in human perception showing that the slope of the line represents the constant sensitivity of the system (the difference threshold remains a constant and relatively small proportion of the base rate of stimulation).

What would the graph look like if sensitivity increased (Figure 18)?

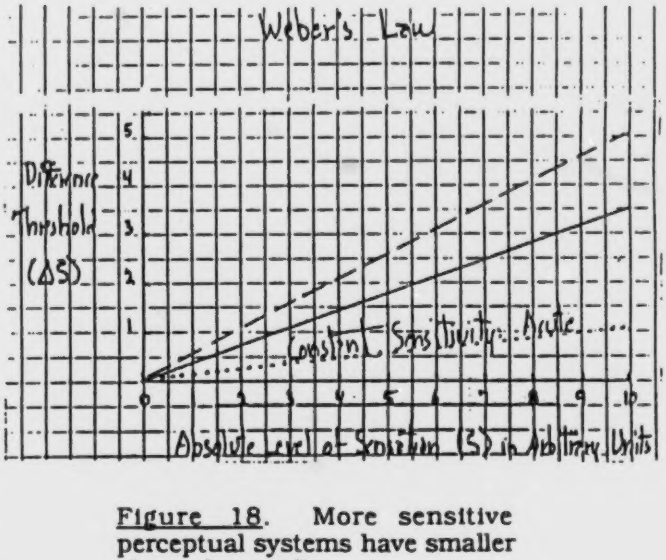

Figure 18. More sensitive perceptual systems have smaller slopes (tutorial).

What would the graph look like if the sensitivity decreased (Figure 19)?

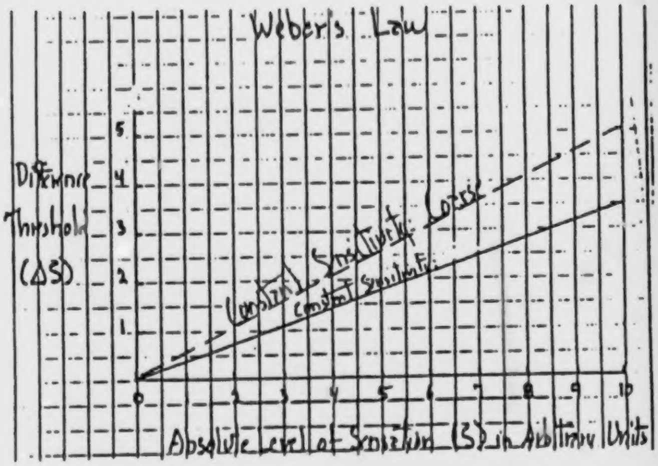

Figure 19. Less sensitive perceptual systems have larger slopes (tutorial).

Suppose you had graphs like those in Figure 20? The basic curve can be modified in various ways all with the intent of showing students what a change in the chalkline on the blackboard implies for the operating properties of the sensory response under inquiry.

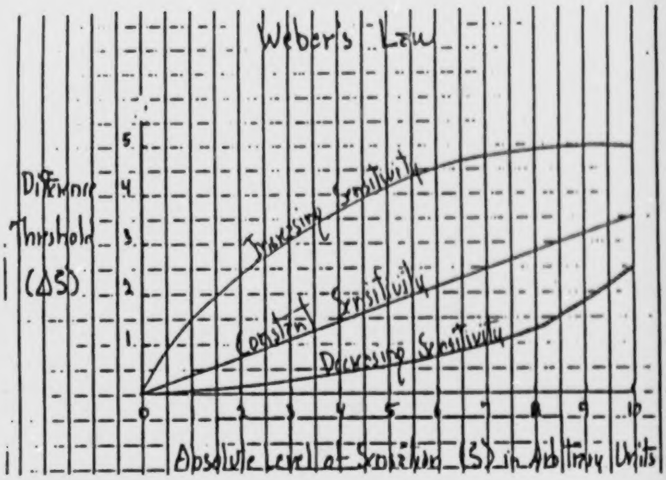

Figure 20. Some perceptual systems show change in sensitivity across their range. Such change can be represented by lines of various degrees of curvature (tutorial).

Figure 21 taken from Granit (1955, Fig. 3, p. 13) represents the relationship between the intensity of a light stimulus and the neural response of a single visual receptor unit in the horseshoe crab. Curve A shows the linear increase in neural spike frequency as a function of logarithmic increases in photic stimulation, a relationship that confirms nicely to the so-called Fechner psychophysical law. This function obtains at the initial onset of the light stimulus. If the light remains on for a period of time, however, the receptor unit becomes less responsive as shown in Curve B, the response curve of the same unit 3.5 seconds after the onset of the light stimulus. When students get these two curves under control, the instructor can pose questions about the response curve to be expected at time values ranging from light onset up to and beyond 3.5 seconds. Once again students have an opportunity to visualize the dynamic nature of sensory sensitivity and adaptation and, perhaps, even to generalize such dynamics to other possible functions describing that change in terms of slope or rate.

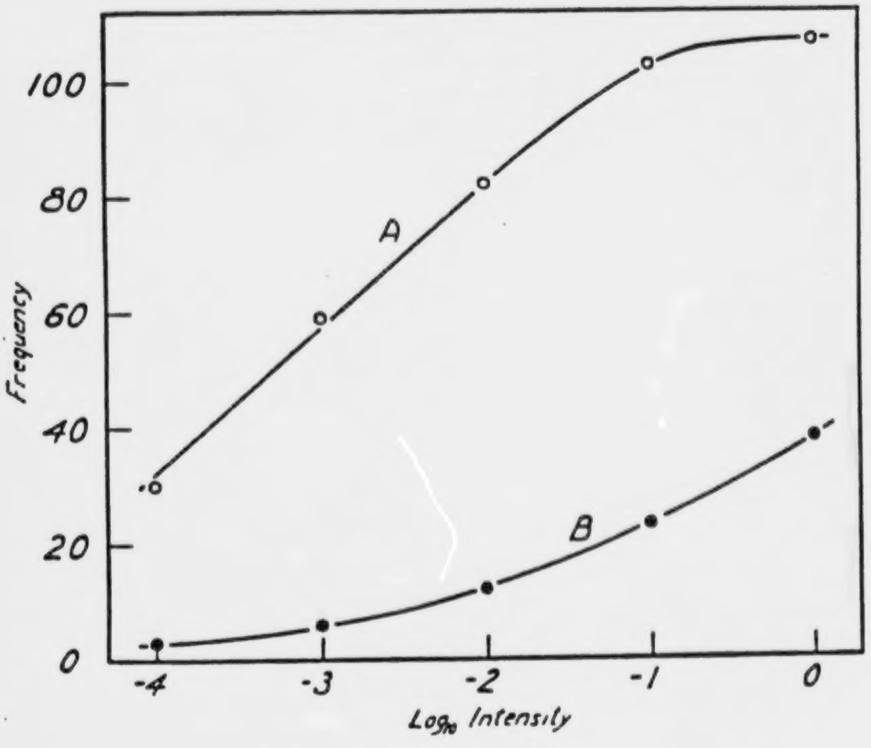

Figure 21. Graph showing firing rate and adaptation of a neural unit in the horseshoe crab to a constant light stimulus. Curve A shows the response at light onset. Curve B shows the response of the same unit to the same light intensity 3.5 seconds after light on-set. Intermediate time values yield curves between curve A and curve B (Granit, 1955, p. 13).

My last example is taken from the work of Hartline, the Nobel prizewinner, and one of his most distinguished collaborators, Ratcliff. Figure 22, taken from Cornsweet (1970), shows the lateral inhibiting effect of a single neural unit (A) in the eye of the horseshoe crab on two of its neighbors (B), which is only 1 mm from (A), and (C) which is 3 mm from A. The B curve in the graph shows the relatively steep decrease in B activity as fiber A activity increases. Curve C shows that A activity must get relatively intense before its activity slows C down at all, and that that slowdown is relatively weak in comparision with B's slowdown as the activity in A increases. Once again when the class has gotten oriented to the graphs, the curves can be interrogated with respect to other possible locations of fibers adjacent to A. Students once more have a visualization that helps them to "see" the inhibitory effects of spatial proximity to the active fiber on both the threshold and the firing rate of neighboring fibers.

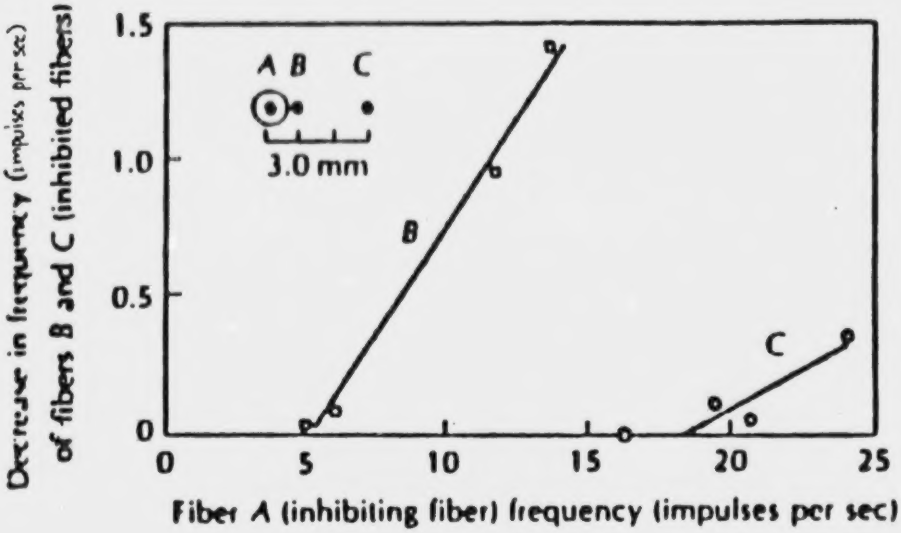

Figure 22. Graph showing the influence of spatial proximity of a neural unit (Fiber A) in the horseshoe crab in the inhibition of the firing of nearby unit (Fiber B) as compared with more remote unit (Fiber C).

Exercises such as these are simple enough to the initiated, but it is not obvious to novices that such graphs compress so much information. I can now identify in retrospect the afternoon about seven years ago when I myself became aware of this. I was taught it by a very fine student in my perception course. Chip Folk and I were sitting over a graph of certain response time data, reported by Howard Egeth of The Johns Hopkins University, deriving a couple of theoretical possibilities from the curve. Things were going well. At one point Chip said, "I didn't know you could do that with a graph." That simple statement was a revelation to me. Since then I have spent more time showing students how graphs can be "unpacked." Chip Folk, by the way, graduated in 1981 and went on to complete his Ph.D. at John Hopkins with Howard Egeth this past spring.

I am not suggesting here in closing that a pedagogy be developed on the basis of this single anecdote. What I do hope is that the above brief review of a number of topics related to graphic inquiry will attract the attention and interest of others who might contribute to such a pedagogy.

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Teaching Communication Skills in the Context of Introductory Sociology

Donald W. Hinrichs

Abstract

Communication is an important sociological fact that is critical to the existence and maintenance of social life and critical to the development, self-concept and everyday life of individual societal members. It is maintained in this paper that it is the responsibility of colleges and each college instructor to help students with the development of their communication skills. The classroom is viewed as the natural setting for such activity. To facilitate communication skill development (writing, speaking, listening), a unique pedagogy is described that includes the following components: small group exploratory discussion, summary of discussion written in a memorandum of conversation format, small group comparison of memoranda for accuracy and recall completeness. Data on the experimental testing of the pedagogy across disciplines are presented. Implementation of the pedagogy in an Introductory Sociology course is described. Results indicate that the pedagogy is more effective than conventional pedagogies in facilitating communication skill development.

This research was made possible by the inspiration of Dr. Robert L. Payton, Past President, Exxon Education Foundation, and two grants from the Exxon Education Foundation.

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Teaching Communication Skills in the Context of Introductory Sociology

Donald W. Hinrichs

Language, and communication in general, in its various forms and contexts, is of interest to scholars in the humanities, social sciences and sciences. Sociolinguistics as a field of inquiry, developed, according to Fishman (1971, p. 8), "as a means of widening the contextual horizons of linguistics, beyond the phrase . . . to the speech act, the speech event, and the speech occasion." Penalosa (1981, p. 4) describes the focus of sociolinguistics as the interaction in small groups (microsociolinguistics) and the relationships between language and society (macrosociolinguistics). Hymes (1984, pp. 471-474) describes the development of sociolinguistics and notes a shift in American linguistics from structural linguistics to functional linguistics, which is a concern for linguistic form within the human context.

As sociolinguistics developed, the necessity of a cross- discipline approach to the study of language and communication became evident, and scholars from a variety of disciplines began to investigate language. As sociological interest mounted, the Sociology of Language became the preferred concept of sociologists working on the concerns of sociolinguistics (Fishman 1968, 1971), and the field of inquiry became more carefully conceptualized and differentiated from sociolinguistics (Fishman 1971, 1972). The Sociology of Language is, according to Fishman (1971, p. 9), "concerned with language varieties as targets, obstacles and as facilitators, and with the users and uses of language varieties as aspects of 'more encompassing social patterns and processes '". Penalosa (1981, p. 4) conceptualizes the field as the study of the relationship of language usage and the social organization of behavior. One of the key concepts of the field is "speech community". Members of a speech community share a specific speech variety and the norms for its use (Fishman 1971, p. 232).

While the Sociology of Language is developing its own perspectives and theories, the contributions of sociolinguistics to sociological analysis and the overlapping interests of the two fields is clear (Kjolseth 1972; Sarles 1972; Ervin-Tipp 1968; Fishman 1971; Maseide 1982; Woolard 1985). For example, Maseide (1982) discusses three models for analyzing social exchange, one of which is the Speech Act Model. This model focuses on the evaluation of the social adequacy and success of language in specific social situations. Greenfield (1972) writes that studies show a relationship between communication and a variety of psychological and social factors, such as setting, roles, and functions of interaction.

Communication is an important sociological concept in and of itself. Communication is a social fact (Luckmann 1984; Kjolseth 1972) and an important aspect of social life. Many scholars have written about the integral relationship between communication, including language, and human existence, society, and human community (Desherier 1984; Grimshaw 1980; Hertzler 1965). Grimshaw (1980, p. 790) writes that "All social interaction involves communication . . . " and Hertzler (1965, p. 19) says that "human existence is welded to language" and "language is the primary condition and factor of human interaction" (1965, p. 20). Hertzler (1965, p. 20) further writes that "language is fundamental to all social processes, and to the persistence and maintenance of all social structures . . . ." The functions of language for the society are well documented (Hertzler 1965; Fishman 1968, 1971; Ghosh 1972; Luckmann 1984).

Language is also an important tool for understanding and analyzing culture (Bock 1986; Edelstein 1983; Pierce 1972). Bock (1986) notes that linguistic forms are a sub-class of cultural forms, and Pierce (1972) writes that we can understand culture by understanding how people classify things and by understanding how these classifications differ. Additionally, language is an important unit of analysis since it is important in defining ethnicity, social classes, and subcultural groups (Bernstein 1968; Giles, Bourhis and Taylor 1977; Nadler 1968; Stevens and Swicegood 1987). Gouldner (1979, p. 28) supports this contention when he describes the new class of intellectuals and technical intelligentsia in terms of a shared ideology about discourse which he describes as "a culture of critical discourse."

Beyond the importance of communication to society and as a tool for understanding social life, communication is socially and psychologically critical to the development, self-concept, and everyday interaction of the individual within a social context (Hertzler 1965; Geertz 1968; Luckmann 1984; Goffman 1961; Mead 1934; Cicourel 1974). Hertzler (1965, p. 396) writes that "to speak is to be oneself and know oneself." Mead (1934, p. 135) writes that "the language process is essential for the development of self". Goffman (1961, p. 7) asserts that face-to-face interaction is equivalent to interpersonal communications. He notes also that during interaction and performance people present themselves through communication by giving expressions and giving off expressions (Goffman 1959).

Communication is a fact of social and personal life. It is estimated that we spend 75-80 percent of our working lives in some form of communication (Benjamin 1986, p. 1; Samovar & Mills 1986, p. 3). Glenn, Richard and Carole Capp (1981, p. 4) report a study of 500 students in a beginning speech class who kept a log of daily activities for three days. On the average, the students spent three hours reading, two hours writing, four hours talking, four and one-half hours listening and two hours in silent thought and meditation. Despite this, many people have difficulty in communicating effectively and many don't discuss important matters with anyone (Marsden 1987).

The importance of communication skills for success in college cannot be overemphasized. In Project Equality, the College Board defined the skills needed to do college work. The skills enumerated included three communication competencies: the ability to "engage critically and constructively in the exchange of ideas"; the ability "to answer and ask questions coherently and concisely and to follow spoken instruction;" the ability "to vary one's use of spoken language to suit different situations" (Feezel 1983, p. 4). Rubin (1983, p. 1) writes that "college classrooms are communication arenas in which effective speaking and listening skills are vital" and "thus, the ability to speak and the ability to listen are extremely basic to the learning process." Wilkinson and Calculator (1982, p. 85) echo this point. Green and Harker (1982, p. 183) similarly write that "teaching-learning conversations, therefore, produce knowledge of social norms and knowledge of conversational demands as well as knowledge of academic content of lessons."

Not only are communication skills important for success in college, improving the communication skills of students is one of the goals of the college/university's curriculum. Furthermore, college is an excellent place for students to develop their communication competencies. The Carnegie Foundation for the Advancement of Teaching (1979, p. 9) in *Missions of the College Curriculum* discusses the diversity of college curricula nationwide and lists the major tasks for institutions of higher education. The first is "to formulate more clearly the advanced learning skills necessary in college and provide better training in them." (1979, p. 264). The Foundation (1979, p. 156) quotes from the 1975-76 Annual Report of Harvard's Dean of the Faculty of Arts and Sciences, Henry Rosorky, who set forth six criteria for undergraduate education. He writes, "An educated person must be able to think and write clearly and effectively . . . Our students, when they receive their bachelor's degrees, must be able to communicate with precision, cogency and force."

Most colleges and universities require that students show competencies in communication skills, especially writing, as a requirement for graduation. The Association of American Colleges Committee (1985, p. 18) that guided the project in redefining the meaning and purpose of Baccalaureate Degrees defined what it considered the "minimum curriculum." One of the nine experiences cited as essential is "literacy: writing, reading, speaking, listening."

Academic disciplines and their respective faculty have a responsibility, therefore, to promote skill development in their classes. Consequently, sociology faculty must concern themselves with critical thinking and communication skill development in their students in addition to teaching the content and perspective of the discipline. Goldsmid and Wilson (1980, pp. 78-121) recognize the importance of such endeavors as they discuss the goals of undergraduate sociology instruction that transcend sociological content: critical thinking and skills in gaining and extending knowledge. Likewise, Lawrence Rhoades (1980) discusses how important it is for the undergraduate sociology curriculum to help students develop life skills such as methods of inquiry, observation and problem solving.

The focus of this research is communication skill development, including speaking, listening and writing. According to Clark, Erway and Beltzer (1971, p. 3) the classroom is a natural setting for studying and developing communication skills since it constitutes a communications system itself. They (1971, p. 3) write further that the classroom "must be a microcosm of the world at large" and that it "must be managed as a complex ever-changing communication system composed of a multiple of human variables."

The Pedagogy and the Course

The communication skill development pedagogy was initially developed, implemented and tested in an Introductory Sociology course taught during a January Term, 1985. The pedagogy was subsequently refined, used and tested during 1986 and 1987 in a variety of sociology courses as well as courses in biology, economics, music, business ethics, Spanish, mathematics, English literature, and freshman colloquy (a required freshmen interdisciplinary course). The structure of the Sociology course which eventually emerged permitted a focus on communication skill development and the integration of course content and skill development. The goals of the original Introductory Sociology course were twofold: 1) to teach the basic concepts, theories and perspectives of sociology; 2) to work systematically on the development of communciation skills including speaking, listening and writing.

The course structure utilized during the January experience included five or six traditional classes per week (lecture/discussion) and one class period of 90 minutes that was designated as a laboratory. The 16 students in the class were randomly divided into small discussion groups of four students each. Subsequent refinement of the pedagogy eliminated the laboratory session and encouraged the instructor to integrate the pedagogy into a class period at a strategic point. In many ways, therefore, the pedagogy serves the same purposes as in-class writing exercises; but it allows a variety of communication skills to be worked on at the same time. Either in a laboratory setting or as an integral part of the class format, the structure of the pedagogy is the same.

To initiate the pedagogy the students are asked to get into their discussion group and a discussion topic directly related to the course material is announced. This topic can be one which has been carefully developed beforehand or one which emerges in the context of the class lecture/discussion. Appendix A contains a sample of discussion questions used in the Introductory Sociology course. After the topic is announced, the students have an "exploratory" discussion on the topic in small groups for ten to thirty minutes (depending on time available) without taking notes. At the end of the discussion, students write a summary of the discussion using a specially developed memorandum format. After writing their memoranda, students discuss their memoranda with each other. During this discussion, each student is able to assess the accuracy and completeness of his or her memorandum and is thus able to understand and assess the accuracy of his or her listening and recall skills.

The memorandum format that is used to guide the written summary of the discussion is an expanded and extended version of the basic format suggested by Dr. Robert L. Payton, past president, Exxon Education Foundation. The format suggests that the following information be summarized: discussion topic; participants; summary of what was said and by whom; observations on body language, conversation tone, setting; analysis of conversation including an evaluation of the discussion and an interpretation; the plan of action. A detailed overview of the Memorandum of Conversation format is in Appendix B.

During the January Term course, video taping was utilized in the implementaion of the pedagogy. As the discussions are occurring, one group is video taped. After the memoranda are written, the class views the video tape and each student takes copious notes. After viewing the tape, and if time permits, there is a short discussion on the content of the discussion and aspects of communication theory (perception, body language, etc). Also, there is an analysis of the quality of the arguments advanced in the discussion. During the viewing of the video tape, the memoranda written by the members of the taped group are photocopied. Each class member gets a copy of one of the memoranda and analyzes it for accuracy and completeness by comparing it to his or her notes and the memorandum format. They write their analysis of this and it is given to the individual who wrote the memorandum.

Since video taping is not practical in many class formats, it is important that feedback be provided so that students can assess the accuracy and extent of their listening and recall skills. This feedback is provided in two ways. The primary way is through the post-memorandum-writing small group discussion described above. A second method requires the course instructor to read and compare the memoranda and provide feedback on discrepancies and coverage.

While the ideal scenario calls for the complete pedagogy to be conducted in class, it is possible for any or all of the three processes (exploratory discussion, memorandum writing, comparative discussion) to be conducted out of class.

Three final comments are appropriate. For the grant, a workbook on communication concepts and theory was developed that included worksheets. Students read a chapter of this workbook for each laboratory session and completed the chapter worksheets. Second, the laboratories and memoranda formed part of the student's class participation grade in the course. Third, in order for the pedagogy to be effective, it must be implemented a minimum of six times over the course of the semester or term. Since practice is important, it is reasonable to assume that the effectiveness of the pedagogy is related to the number of times students are involved in it and receive feedback.

Effectiveness of the Pedagogy

Two hypothesis guided the research component of the study. The first hypothesis is that students are in need of improving their communication skills. The second hypothesis is that the pedagogy results in greater improvement in communication skills than conventional pedagogies.

To assess the effectiveness of this pedagogy, an experimental design was employed which included extensive pre- and post-testing. For January, 1985, the experimental group (sociology class) consisted of 16 freshmen, twelve women and four men. A history class of 16 freshmen (eight women and eight men) was chosen as a control group. This specific class was chosen because of its size and because it contained all freshmen. During the spring semester 1986, the pedagogy was further tested across disciplines. Six faculty were selected to participate in the study. The faculty members represented the humanities, sciences, and social sciences, had earned high teaching evaluations, and had reputations for open-mindedness, cooperativeness and creativity. Each faculty member was asked to identify one course in which he or she would implement the pedagogy. One faculty member identified a team-taught course and thus, a seventh faculty member was added. Control class matching was conducted on the basis of (1) department or individual representation; (2) approximate class size; (3) course level; and (4) evaluations and reputations of the faculty. Following are the classes which formed the basis of the study:

Experimental Classes	Associated Control Classes
Biology 102: General Biology	Astronomy 102: Stellar Astronomy
Economics 102a: Principles of Economics	Economics 102b: Principles of Economics
Calculus 112a: Calculus of a Single Variable	Calculus 112b: Calculus of a Single Variable
Music 106: History of the Art Song	Music 142: Theory II
Management 360: Organizational Ethics (team taught)	Religion 139: Protestants, Catholics, and Jews (team taught)
Spanish 302: Advanced Conversation and Composition	Spanish 314: Cervantes

The subjects of the study were students who had enrolled in the six experimental classes (290 students) and six control classes (150 students).

To assess levels of communication skill development, three instruments were developed: student essays, video-taped discussions, and a self-appraisal questionnaire.

The first instrument is the student essay. Students viewed, in large groups, a ten minute video-taped discussion between two faculty members. Students were instructed to observe the discussion without taking notes and, when the discussion was completed, to write about the discussion. Each essay was read by two of three trained blind faculty evaluators. The scores were averaged for each subject. The essays were evaluated using the following criteria: amount of information recalled, accuracy of information recalled, organization, ability to express ideas in writing, grammatically correct language, and overall (composite) score.

The second instrument is the video-taped discussion. Students were placed in small groups and were instructed to select one of two discussion topics. Each group discussed their topic for approximately five minutes while being video-taped. Three trained, blind faculty evaluators viewed each discussion and evaluated each participant. The scores were averaged for each subject. The discussion participants were each evaluated using the following criteria: adherence to and relevance of discussion to selected topic, use of logic, use of language, delivery, listening ability, paralinguistic effectiveness, attitude and personal attributes, use of communication functions and overall communicative effectiveness.

The third instrument is the "Gettysburg Communication Skills Inventory." This self-appraisal questionnaire was designed to assess the level of comfort and self-perceived level of skill development in speaking, listening, general small group and class interaction, and writing. Thirty-seven questions were developed using a five-point Likert scale. Three questions were five point multiple choice questions.

Faculty who particpated in the experiment and an additional 14 faculty members who used the pedagogy in their courses during the fall and spring semesters 1986-1987 participated in a two and one- half day training workshop designed to introduce communication theory and the pedagogy and to provide practical experience on implementing the experimental technique in their classes.

Three faculty were selected and trained as evaluators. Faculty evaluators were blind to pre-post test and experimental and control conditions. Evaluator ratings were averaged for each subject. Subject data were organized and analyzed using t-tests of significance. Due to small class sizes, results were analyzed for four experimental sections (n=198) and their matched control sections (n=92). For the purpose of data presentation, only the results obtained in the 1986 study will be reported. However, they are consistent with results for the test of the pedagogy in January 1985.

The results of the study tend to support the hypothesis that there is a need to address the level of communication skill development among Gettysburg College students. The pre-test scores of students in all experimental and control classes were averaged in order to determine overall base measures of communication skill development.

Base measures of student essay performance suggest a need to develop student written communication skills. Students were somewhat below average (2.50) in the amount of information they had recalled in their essays. "Average" is a score of 3.0 on a five point scale and is defined in the training manual for evaluators. Students were slightly above average (3.11) in the accuracy of the information which they had recalled. They were slightly below average (2.95) in their ability to express ideas in mature, grammatically correct language. And they received a composite score somewhat below average (2.69).

Base measures of student video-taped performance suggest a need to develop student oral communication skills. Student test scores suggest that students were somewhat above average (3.32) in their ability to discuss a topic, average (3.00) in their use of logic, somewhat above average (3.38) in their use of language, slightly above average (3.07) in their delivery, somewhat above average (3.27) in their listening ability, slightly below average (2.92) in their paralinguistic effectiveness, somewhat above average (3.19) in their attitudes and personal attributes, and somewhat below average (2.70) in their use of communicative functions. Their overall communication effectiveness was rated slightly below average (2.94).

Base measures of the student self-appraisal questionnaire suggest some need to develop student communication skills. Students generally rated their communication skills above average and well above the ratings assigned by faculty blind judges.

The results of the experiment tend to support the hypothesis that student participation in the experimental pedagogy over a period of one semester results in greater improvement in student communication skills than does participation in conventional pedagogies.

Measures of student essay performance suggest that experimental subjects generally demonstrated somewhat greater improvement than control subjects. Experimental subjects improved on 13 of 20 (65 percent) class-variable dimensions, one of which was statistically significant ($p<.05$). Control subjects improved on nine of 20 (45 percent) class-variable dimensions, none of which were statistically significant ($p <.05$).

Measures of student video-taped performance suggest that experimental subjects generally demonstrated somewhat greater improvement than control subjects. Experimental subjects improved on seven of 36 (19.4 percent) class-variable dimensions, three of which were statistically acceptable ($p <.05$). Control subjects improved on one of 36 (2.8 percent) class-variable dimensions. It was not statistically acceptable.

Measures of the student self-appraisal questionnaire suggest that experimental subjects generally perceived greater self- improvement in their level of communication skill development than did control subjects. Experimental subjects improved on 90 of 160 (56.3 percent) class-variable dimensions, 32 of which were statistically acceptable ($p < .05$). Control subjects improved on 81 of 160 (50.6 percent) class-variable dimensions, 20 of which were statistically acceptable ($p < .05$).

There appears to be strong support for the effectiveness and utility of the pedagogy among the 21 college faculty who have implemented the pedagogy in their classes. Of these 16 (76.2 percent) report that they would use the pedagogy on a regular basis, three (14.3 percent) say that they would probably use the pedagogy in future courses and two (9.5 percent) report that the pedagogy would require significant modification of their course structure and is therefore not feasible (science faculty). Everyone expressed commitment to the need to develop student communication skills.

Discussion

The findings of the study tend to support the hypotheses that students are in need of developing their communication skills, and that the pedagogy yields greater improvement in student communication skills than conventional pedagogies. Experimental subjects appear to demonstrate greater improvement than control subjects on the essay measures, videotaped measures and the self- appraisal questionnaire. Furthermore, the faculty who implemented the pedagogy generally report strong support for the pedagogy.

As important as the data presented are, the student evaluations of the laboratories and the individual successes that were witnessed are an even more significant testimony to the usefulness of the pedagogy. I am convinced that the pedagogy can have a significant impact on the development of communication skills.

Finally, the pedagogy is sociolinguistically sound in the context of Kearney's (1984, p. 163) contention. She discusses what is called an "interactional course design" that "includes authentic communication situations in both the acquisition and activation phases" of communication.

Several problems were encountered, however, in the course of the experiment. The first problem was the resistance of many students to a new pedagogy requiring their involvement in the learning process. The second problem was what appeared to be degeneration in some communication skills over the course of the semester by both experimental and control subjects. One possible explanation for this degeneration is a problem encountered in the post-testing. The post-testing occurred during the final week of classes. Many students perceived the post-testing as being intrusive of their time during a high-stress, high-demand period. This was somewhat supported by the results of the videotape variable, attitude and personal attributes. Seven of the eight classes degenerated. Five of these were statistically significant (p<.05). Thus the level of degeneration calls into question the credibility of the post-test results. The final problem concerns the short-term nature of the study. I suspect that numerous opportunities to participate in the pedagogy over four years would result in greater improvement than evidenced after only one semester.

In addition to the development of communication skills, the pedagogy can serve the academic objectives of a course. The pedagogy allows students to become involved with course issues and to apply concepts and theories. And, the writing component of the process can serve as the basis for a more substantial writing assignment. Furthermore, communication, as discussed in the introduction to the paper, is an important social process that occurs in the context of many sociological and social psychological variables. Thus, communication is a skill and a social fact that makes it a natural for development and discussion in any sociology course.

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Appendix A

Discussion Questions

1. A. How important is communication to the existence and functioning of groups and society? Fully explore. Think of activities/processes that are more important than communication.

   B. How important is communication to the functioning of individual persons in groups and society?

   C. Which form of communication is most important in everyday life, speaking or writing? Why?

2. You work for the President of the American Sociological Association. You are on a Task Force with three other persons who each represent one of the following associations: American Psychological Association, the American History Association, the National Political Science Association. Your task is to develoop a Code of Ethics for research in the Social Sciences. In other words, you are to draft specific guidelines for researchers to guide their conduct in their research. For inclusion in your draft Code of Ethics, a guideline must be approved by a majority of the Task Force members. As your meeting time ends, plan how you will proceed in order to complete your task.

   Memorandum of Conversation: Write a memorandum of conversation to the president about this meeting.

3. You are assigned the task of setting up a new society from scratch by taking a herd of babies from a war-ravaged country to an island in the Pacific Ocean. You must decide on the five basic values that will form the core of this new society. Task: agree on the five values that you will implement in this society and discuss why you chose them.

   Write a memorandum of conversation to the director of the agency for which you work. If you do not complete the task in the allotted time, be sure to have a plan for its completion.

4. Reference: Incident on New York subway where a man "systematically" shot each of four teenagers who allegedly were threatening him with makeshift weapons as they attempted to get money from him. All of the teenagers are alive, although one is paralyzed.

   Problem: You are a panel of citizens who must decide whether this man should be charged with a crime and tried for it in criminal court. Your decision must be by majority vote.

Process: Discuss the information/factors which you feel are important to consider in making your decision. What other information would you like to have if there were time to get it? Make your decision.

Memorandum: Write a memorandum of your conversation to the Mayor of New York City with your group's recommendation. Give the reasons for the decision. Regardless of your decision, make recommendations for information that must be collected in order that all citizens in the city will understand all of the dimensions of the event.

5. You are on a small Task Force appointed by the President of the United States. Assume that there still are major differences between males and females in terms of access to various occupations, job opportunities, division of labor, salaries, etc. Also, assume you want to get total equality for males and females in the U.S. society by 2000 A.D. Develop a comprehensive plan for doing this. Items in the plan must be agreed upon by a majority of the members of the Task Force.

   Write a memorandum to the President detailing your discussion. Include a plan of action if you do not complete the task.

6. The Director of Institutional Research at the College has asked you to study a particular fraternity to determine from a functionalist perspective if there are any pathologies that exist in the organization and what might be causing them. Your task is to design a research plan for the task at hand. If you do not complete the task in the allotted time, be sure to develop a plan for its completion.

   Write a memorandum of conversation to the Director of Institutional Research detailing your plan including strategy, questions you will ask, etc.

7. As a group, decide what are the three most serious social justice issues in the world today. Put them in rank order of importance.

   Also, as a group, decide what are the three most serious social justice issues in the United States today. Put them in rank order of importance.

   Write a memorandum of conversation to your Congressperson telling him/her the results of your discussion. Detail the reasons discussed for your choices and rank ordering and why other issues discussed were not chosen.

   If you do not complete the task by the time your discussion period is over, decide, as a group, how you would proceed to finish the task if you had to.

8. Situation: PU University is located in a deteriorated area of a large city. The area is currently being used as a residential area for poor Blacks and other minorities and a retail area for local and city-wide sales. There is a housing shortage in the city. PU University is totally land-locked at present. On three sides the Univeristy is bounded by Lake PU. On the fourth side is the deteriorated area described. All land currently available is in use and cannot be converted to other uses. FUN corporation has just given the University $5 million to build a new center for Minority Studies. In order to do this, the University must purchase 20 acres of the land that lies directly adjacent to the campus. The University has accepted the grant and is negotiating with local landlords for purchase of the land at a premium price. However, as the planning progresses, residents, merchants, and minority people in the city begin to protest the University's plan.

   Scenario: Tomorrow a series of four small group discussions will occur in order to resolve the problem at hand. Each group will be comprised of the black Director of the City's Redevelopment Authority, the black leader of the Civil Rights Committee, the white representative of the absentee landlords and the white representative of the University President.

   Group Assignments

   Group 1: Black Director of the City's Redevelopment Authority.(The Authority has applied for funds from the Federal Government to upgrade the area in question for residential and retail purposes).

   Group 2: Black leader of the Civil Rights Committee which is representing tenants and merchants in the area. (The tenants and merchants do not want to move and feel that they are being discriminated against by the University. They feel exploited).

   Group 3: White representative of the absentee landlords (who are willing to sell their property in the area for the right price).

   Group 4: White representative of the University President. (The President has accepted the Foundation grant and wants to proceed with the plans).

   At the end of the allotted time, write a memorandum of record to yourself summarizing the position of your group on this issue.

9. Refer to previous session. Have an exploratory discussion with the aim of making progress toward the resolution of the problem set up in the situation. Each of you will report back to your supervisor (superior, group) via a memorandum of conversation.

Appendix B

THE MEMORANDUM OF CONVERSATION

A Detailed Overview

I. Data

- A. Topic of discussion/conversation
- B. Participants (names and positions)
- C. Discussion Summary
    1. Describe what was said; highlight statements.
    2. Identify who said what.
- D. Observations
    1. Who didn't speak? Why?
    2. Vocal characteristics: intonations, inflections.
    3. Identification of omissions; What wasn't said that should have been said?
    4. Body language and perceived meaning.
    5. Tone of conversation.
    6. Setting and its impact.

II. Analysis

- A. Evaluation of Discussion
    1. Judgments about quality of argument: consistency and fallacies.
    2. Persuasiveness and why.
- B. Interpretation of Discussion
    1. Perceived motivation and intent of participants.
    2. Biases detected.
    3. Conclusions reached or things that the participants seemed to conclude.

III. Plan of Action

- A. What should be done next?
- B. Who should do what?
- C. Recommendations

Critical Thinking: Language of Inquiry in the Disciplines at Mercer

Vera H. Goodkin

At Mercer County Community College, critical thinking to govern language and inquiry in the disciplines was a logical outgrowth of our pioneering efforts in the field of using writing as a tool for thinking about- and learning- subject matter across the curriculum. This enterprise began on our campus in 1979, with the formation of a group of representatives from Allied Health, Biology, Commerce, Engineering, Visual Arts, Criminal Justice, Academic Skills, Archaeology and Ornamental Horticulture interested in enhancing student thinking and learning through writing components in their courses.

Our committee began investigating student thinking/learning problems. These were found to be the inability to define precisely, classify properly, organize thoughts and material logically, reason independently/hypothetically/critically, work from context, and evaluate consequences. Our immediate goal was to encourage colleagues on campus to use strategies to improve students' thinking/learning skills in their respective disciplines. To that end, we met regularly to devise strategies that would work in making students become actively involved in learning. Field trip reports, reaction papers, film critiques, free and focused journals and conceptual questions for discussion of controversial issues became our most viable tools.

My own research in the "Intellectual Consequences of Writing" proceeded concurrently with the Committee's intensified activities. An entomologist, a mathematician, two psychologists, one nursing and one dental assisting professor became involved as faculty volunteers and encouraged students in their varied disciplines to participate in the investigation. Due to time constraints, I have chosen to share a limited number of experiences from three of the six disciplines involved: dental assisting, entomology and mathematics.

As part of her teaching strategy, Sandy Thiel, coordinator of our Dental Assisting program, would ask her second-year students to explain the concept of x-rays to a young patient's anxious mother, report on the activities in writing and then share the report with the class. This had a two-fold purpose: one was to learn factual material; another to see whether the students had the motivation or the thought-process to say, "How would I do it?" Another of Sandy's individual unit objectives may have specified "describe in writing the difference between gold and amalgam". For "true" and "false" questions, she asked students to alter the "false" statements to make them "true", a technique that encouraged organization of thought. Sandy favored in-class panel discussions for which both the pro-and conpanelists had to write a position paper, so that they were, as she said, "prepared to fight". And they all had to write a reaction to it afterward. Her major concern was to develop their analytical and critical thinking skills.

As for student reaction: Kathy Olah, a second-year dental assisting student, preferred reaction papers to most other assignments because she liked finding out about things she didn't know before and then reacting to them by agreeing or disagreeing. As she put it: "You do more than just expand your knowledge; you get to a stage where your reach exceeds your grasp; you test your own wits and find out how far you can go."

In the "Profession" course, Kathy dealt with four questions concerned with ethics and legality in dental practice by using analysis, synthesis and organization of material, tasks quite high on the scale of abstraction. Before any formal assignments in the first of Sandy Thiel's courses, Kathy and her classmates had to submit their rationale for, as well as goals and objectives in, dental assisting. In the two preliminary drafts and the final copy of this paper, Kathy demonstrated her reasoning process. The first draft showed a quasi-random sequence of ideas. The second draft reflected several changes, and the final product was a clear statement of purpose, planning and conclusion. Kathy placed great emphasis upon the importance of learning in the context of her own language, i.e. her transformation of textual material into something that could be integrated into what she already knew.

Biologist Joseph Butchko was particularly concerned about the student's ability to take specific information in one field and use it in other areas. In attempting to use writing to complement laboratory activities, Joe Butchko designed a tripartite approach. He sent students out into the field in teams to record environmental data, such as temperature and humidity readings, as well as to note their insect findings sketchily on index cards. He then asked them to convert these brief notes into more detailed narratives. Upon their return to the next laboratory session, students would transfer this expanded information onto formal data sheets, with space provided for qualitative and quantitative data. The language went from informal description to proper scientific terminology. Students were learning "by expansion". Joe Butchko's students wrote to make connections, to apply learning gained in one area to another and to release a free flow of ideas in response to open-ended questions. Joe Butchko recognized the importance of sequencing intellectual and writing tasks - and of bridging the gap between disciplines.

Bill Cope, one of Joe's entomology students, would write questions in the margin of his rough notes. In the lab field trip assignments, Bill went from the general to the specific; first explaining the material to himself and then to his instructor. His notes were heavily annotated and filled with marginal notes referring to other self-written or textual sources related to the subject matter under discussion. Bill's use of writing sharpened his powers of observation. In his words: "You have to know what you are looking for or at to write about it." Bill's writing also focused attention and fostered analysis.

Mathematician Don Reichman had been experimenting with groups of students for some time, to explore the relationship between writing and thinking in mathematics. To test his hypothesis as a participant in the study, Don showed his basic mathematics class how to find the lowest common denominator. When several students were unable to pick up the process, Don said, "That's fine, don't worry; instead, write down in words everything you are doing. Maybe that will open the door to how it should be done. Maybe the writing will force you to think about what you are doing, and your new thoughts will allow you to think about what's going on here and what you need to do." "It seems to me," he said "that writing forces us to think. The problem with mathematics is that sometimes it is not clear what to think about. I find that when I ask students what they are thinking about when they are stuck on a problem, they're not thinking about anything in particular. Consequently, I feel that writing, at least, forces them to stay involved with the problem. It's kind of like a baseball player who gets up to bat convinced he can't hit the ball; won't even look at it, and just sort of stands there looking into right or left field. Writing in basic mathematics may not make students swing, but still keeps them looking at the ball. That sounds like a better idea than staring into the bleachers."

In calculus, Don asked his students to problem-solve through writing, to use writing to understand a problem they were unable to understand before. In his view, at this level, an effective assignment was one that enabled students to write about the relationship between problems they could do and problems they couldn't do. If they could say, "I solved this problem this way, but in the next problem, suddenly, I find that it's not the same. There is something different about it." Then if they can isolate the source of the impasse, with the aid of verbalizing their process in writing, they have made a "quantum leap" in mathematical learning.

A combined interview with calculus students Frank Zrinsky and Graham Phillips confirmed Don's hypothesis. In Frank's words, "When Prof. Reichman said 'just put down thoughts as they come to you; don't worry about their context, just make them make sense', I started putting down thoughts as they were coming to me, and by the time I finished, they were not as jumbled as I thought they would be; they made sense in the long run. When I just started the problem, I couldn't figure out the best way to do it, but as I kept writing in terms of "what if I try this approach?" or another? Then I solved the problem."

As our Writing Across the Disciplines program became quite entrenched, we continued working to aid students in finding new ways to use the enormous wealth of current technical knowledge. We implemented a New Jersey Department of Higher Education-funded Pilot Project in 1985-86. This decision grew out of our 1984-85 grant for evaluation of the strengths and weaknesses of humanities course offerings on our campus, including faculty surveys and sustained activities of a 13-member humanities council. To encourage critical thinking, we offered our students a series of humanities colloquia dealing with ethical/moral concerns. Faculty members across the disciplines who volunteered to become "sponsors of the humanities" directed their students to attend colloquia relevant to the targeted courses in their disciplines, programs or curricula. In addition to attending, students were to respond in writing to the issues presented. Both of these activities were considered course completion requirements.

The work of the Mercer Humanities Council in the preliminary 1984-85 grant had proven conclusively not only that the college had an obligation to enlighten students on current ethical and moral issues, but also to change student attitudes and approach to learning. We recognized a great need to forge connections between Technology/Science and the Humanities to improve students' ability to evaluate critical issues, make intelligent decisions and ethical choices.

More pragmatically speaking, we were hoping to prepare students for 1990 - and beyond - when computer science students, upon graduation, will have to do more than write programs; nursing students will have to deal with more than properly ministering to patients. Computer professionals may very well confront issues regarding the confidentiality of data and the uses to which such data could be put, and allied health personnel will invariably meet situations which are not addressed by traditional medical ethics. As a result, an urgent need exists to improve students' discernment and critical thinking, so that they make intelligent decisions and ethical choices.

We agreed that initial efforts should deal with ethical and moral concerns. We further agreed that, to strengthen students' critical thinking in the Humanities, these series needed to be multi-dimensional, broad-based, and if necessary, even controversial. Because Mercer had never sponsored a college-wide series of this type, council members recognized that there must be extraordinary planning and cooperation across academic disciplines to make it a successful series.

The primary goal of the grant proposal was to enable us to prepare students to think more clearly and analytically about major Humanistic/Humanitarian Issues and about the outcomes that may result from particular decisions. To start working toward this goal, the following six Colloquia were planned: Human Rights; Media Rights and Responsibilities; Star Wars; World Hunger; When Does Life Begin and End?; and Computers: Uses and Abuses.

As soon as our grant proposal was approved, the faculty members were invited to participate in the project by selecting one or several of their courses, requiring attendance at one or more of the colloquia and assigning students a reaction paper in response to the presentation or panel attended. The reaction papers, intended to guarantee the student's engagement with the material, were to be graded on a pass/fail basis.

We expected the colloquia to improve students' ability to see relationships, analyze another person's viewpoint, organize and present ideas and values more clearly and put facts and concepts into their own words in discussions- as well as on paper- thereby making significant connections. The specific links between courses and colloquia remained the province of individual instructors.

The specific project design adopted for this colloquium series, containing six lectures and/or debates representing the following topical areas, included in the fall semester:

1. The colloquium on Human Rights, including an examination of the conflict between individual liberties and the needs of the state.

2. Then came Media Rights and Responsibilities, with a debate on whether the visual and print media have exceeded the rights guaranteed them by the first amendment.

3. And third, Star Wars, a debate to generate controversy over the administration's defense plan and the feasibility of its implementation, with a corollary theme of whether the massive expenditures required were justified and whether they should be expanded for other purposes.

4. For the first event of the spring semester, the program we planned was designed to consider the growing problem of world hunger, with three presentations on the world's food crisis, its economic and political causes and potential methods of alleviating the problem.

5. Next, the council scheduled a forum on when life begins and ends, with a presentation on the problems generated by medical break-throughs and their effect on traditional medical ethics.

6. The series closed with "Computers: Uses and Abuses". In this colloquium, the debate centered around the rapid growth in computer applications, and the changes these applications would bring about in an individual's life throughout the next century.

The exact content for each panel debate or lecture was determined by the expertise and interests of the various presenters.

All members of the faculty from across the disciplines had been invited to participate in the project. However, only those who wished to make attendance at and written response to the programs of their choice a course completion requirement received a Humanities Council-designed and distributed packet to facilitate participation in the project. The packet contained a rationale, a tentative colloquium schedule, guidelines, a student hand-out, a reaction paper instruction sheet for students and faculty and an offer of assistance from the project director, yours truly.

Faculty sponsors of the humanities represented the areas of Archaeology, Commerce, Computer Science, Economics, Engineering, English, Nursing, Nutrition, Philosophy, Photography, Psychology, Sociology, Spanish, Speech, and Visual Arts.

At the conclusion of the project, we felt that the primary objectives had been attained beyond initial expectations. As a result of attending and responding to the colloquia, Mercer students in diverse programs and curricula were required or encouraged to think critically about societal issues and reach informed decisions. A case in point was the reaction paper authored by an extremely conservative student of mine who would make Archie Bunker look like a flaming liberal. To my absolute amazement, John admitted freely that his smugness had been profoundly shaken by the presentation of the "Hunger" program. And I quote: "This forum has changed my views greatly. Before this forum, I felt that the people who are hungry brought their hunger upon themselves. It scares me a little to think that if I was in the hungry people's shoes, and the other people thought like I did before the forum, I would be in great trouble. Before, I never thought of sending money to these victims, but now I am giving it a second thought." And, of course, thought rather than style was the key word here - one that was missing before the program.

Finally, the Colloquium project is directly responsible for subsequent college-funded lecture series and the insertion of new critical thinking components into Architecture, Mathematics, Data Processing, Engineering, Nutrition and Speech courses to complement writing-to-think pedagogy. And of course, we have just begun to fight!!!

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Pedagogical Approaches to Critical Thinking and Language

In this section, descriptions of courses and pedagogical approaches with an emphasis on critical thinking and language--aptly called "critical discourse" by William Yaremchuk-- are presented. Zabrowski's description of the need to develop "critical discernment...what is more appropriate, and what less, in any given instance where judgment must be exercised." Many presenters note that students learn when they engage in critical thinking, as they "grapple with knowledge in a generative and personal sense" (Berry and Rose). In addition to the papers by Elvera Berry and Barbara Rose and by Yaremchuk, this section includes papers by Carolyn Sobel, Charles Zabrowski, and Freda Hepner.

In *Critical Thinking: Transformed through Learning,* Berry and Rose draw parallels between the processes of learning and of writing, and explain how writing experiences provide the opportunity for students to engage in "deliberate structuring of meaning," resulting in active, social, dynamic, and cooperative learning. They suggest writing activities, including journal writing, in such varied disciplines as mathematics, history, and music.

Carolyn Sobel, in *Introduction to the Liberal Arts: A Dramatic Approach to Critical Thinking,* describes an interdisciplinary, team-planned, and partially team-taught course, in which philosophical issues are introduced through reading and viewing drama. Scholarly readings drawn from diverse, but relevant, content areas are also assigned. Writing assignments to accompany each play are completed and criticized by peers in workshop sessions. Attention in such session to over-generalizations, "unsupported claims, faulty logic, manipulation of the reader, and evidence of the writer's having accepted cant and empty slogans" focuses attention on the development of critical thinking.

Charles Zabrowski, in *Critical Thinking via Critical Writing: The Cross-Disciplinary Case and the Case in Classics,* describes the content of a cross-disciplinary course "intended to provide students with a common intellectual experience and designed to expose them to critical thinking by reading, reflection, discussion, and writing on seminal works...," including an assigned paper on a "synthesizing topic." The problem for faculty today, he suggests, is to communicate the abilities of "critical discernment," previously developed through the study of Latin and Greek.

Freda Hepner, in *Writing to Learn,* also describes an interdisciplinary course entitled "Research Writing," a second semester course requiring students to use language as academic discourse for developing a research project. Reflective journals, group discussion of current societal issues, design of interview schedules, and survey procedures were involved. Students wrote articles and made presentations for different audiences. Hepner suggests that the course "improves skills in writing, in learning in the disciplines, and in critical thinking. Students make connections between discrete areas of study,...and "learn how to organize and evaluate data to present to appropriate audiences for different purposes."

William Yaremchuk's *Introduction to Critical Discourse* is a description of a course designed to develop critical thinking skills through, in part, communicative activities such as presentations of arguments, panel discussions, debates, and problem-solving projects. Students learn to "logically, systematically, and objectively analyze and assess written and oral messages...which seek to gain the acceptance of the listener." This approach focuses on the analysis and assessment of persuasive discourse.

Critical Thinking: Transformed Through Learning

Elvera Berry and Barbara Rose

The purpose of this paper is to examine language as a model of inquiry which transcends disciplinary bounds. While we subscribe to the tenets held by advocates of writing/thinking-across-the-curriculum, and practice many activities consonant with cross-curricular programming, we see a need to broaden the theoretical base of such programs and to investigate the implications of a commitment to language itself as a model for thought. We focus on writing, therefore, only to the extent that it is a tangible expression of linguistic inquiry.

Our discussion will be organized into three sections: assumptions about language, learning, critical thinking, and writing; our experiences incorporating various forms of discourse in teaching and learning; and insights concerning the benefits, potential risks, and implications of using language-based inquiry.

Assumptions About Language, Learning, Critical Thinking and Writing

Language

Inasmuch as critical thinking is language-dependent, we shall begin by laying a theoretical foundation which underscores the centrality of language itself. We find the perspective of literary and social critic, Kenneth Burke, to be especially helpful as we consider the transforming power of language-based inquiry.

The unique capacity of the human animal to engage in thought, dialogue and interactive community is grounded in the use of symbols, specifically, in language. Economist Kenneth Boulding (1956) defines the study of humanity as "the study of talk," suggesting that "human society is an edifice spun out of the tenuous webs of conversation" (p. 45). One learns, from responses received, the meaning of what one does and the symbols appropriate to that knowledge. Symbolization allows one to solidify, name and classify experience; shared symbols embody patterns of response which reflect both individual and collective commitments, and which enable the symbolic interaction requisite to personal identity and to identification with the community. Indeed, Boulding perceives "the whole movement of society as a process of image-formation under the stimulus of messages transmitted by networks of communication" (p. 98).

Kenneth Burke agrees. We move, he tells us, "by and through language, beyond language," particularly in the "socio-political hierarchy which is the most immediate of all man's [sic] concerns" (Rueckert, 1963, p. 230). Language, the mediating link between individual and society, is thereby elevated to the transcendent realm of moral choice, rather than relegated to the level of a mechanistic, pseudo-neutral vehicle. "Language acts as a key motive or scene for all man's [sic] acts" (p. 130), providing access to both individual and collective action. Symbol-dependent individuals are perceived in relation to interdependent others.

Burke's own adherence to the centrality of language is epitomized in his definition of man [sic]. Not decrying the Aristotelian "political animal," the anthropological "culture-bearing animal," the psychological "social animal," or the philosophical "rational animal," *et cetera*, Burke (1966, ch. 1) seeks to subsume such perspectives under a linguistic umbrella containing five clauses. These general clauses meet his own criterion for a definition: each clause is "like a chapter head, under which appropriate observations might be assembled, as though derived from it" (p. 3). Addressing human "physicality, animality, and symbolicity" (p. 24), this definition is a precursor to Burke's most recent modification: "We are bodies that learn language" (Brock, Burke, et al., 1985, pp. 31-32). At the same time, it explicates his earlier reference to "the political, word-using, tool-making animal" (Burke, 1961, p. 370). Burke (1966, p. 16) proclaims:

> Man is
> the symbol-using (symbol-making, symbol-misusing)
>   animal
> inventor of the negative (or moralized by the
>   negative)
> separated from his natural condition by
>   instruments of his own making
> goaded by the spirit of hierarchy (or moved by
>   the sense of order)
> and rotten with perfection.

This summary definition may be likened to a work of art. While its statement is complete, its artistry lies not in that which is stated, but in that which is released. It is language, that is, "symbolic action," that enables both statement and release. Such analysis "by and through language" leads to human definition not merely in terms of language, but also in terms of motives "beyond language." "Symbol-using," for example, takes on a new significance in the presence of "symbol-misusing." As "inventor of the negative" which also "moralizes," one becomes a victim of personally created dilemmas. Finally, the subtle juxtaposition of being "goaded by...hierarchy" and "moved by... order" explodes in the equation of "rotten" with "perfection." Thus, Burke perceives humanity in its element: dialectic embedded in language as symbolic action.

Implicit in all acts is the "principle" of the negative which, according to Burke, is "a specifically linguistic invention" (Burke, 1968, p. 450); "there are no negatives in nature...the negative is but a principle, an *idea*, not a *thing*" (1966, p. 9-10). Words, then, are not the worlds for which they stand, but they do enable conceptualization of those worlds. "Words are a mediatory realm, that joins us with wordless nature" (1961, p. 373). Words reflect both *homo faber* and *homo sapiens*; the former uses old symbols to generate new words while the latter uses new words to explicate old symbols. In either case, language serves both to define and to join, as well as to come between.

In his most recent work, Burke (1985) underscores the word "discriminations" as the mark of being human. He argues that to speak of "bodies that learn language" is not to speak metaphorically: "the definition of the human being as a symbol- user is *literal*."

Language is:

> The arbitrary conventional collective medium of expression and communication (with corresponding modes of attention, or stores of symbol-guided discriminations) most amply equipped to discuss itself and all other such mediums...
>
> It is the medium best suited to speculating on the possible best definition of ourselves (Brock, Burke, et al., 1985, p. 31).

Burke perceives this capacity for linguistic discriminations to be the differentiating characteristic of the human animal. He points out that "dogs may bark, but they do not bark about barking!" That is, non-human creatures use signs--even highly complicated signs--to communicate. Bees and dolphins, for example, have been subjects of extensive investigations. However, such animals do not, to our knowledge, devise words which are symbols for other words and ideas, as well as for objects. That gift (or "curse") of language belongs to us.

We believe Burke is right. It is only in our capacity as symbol-using creatures that we are able to conceptualize, reflect and imagine, and to translate those ideas into "words" we hold in common with others in our linguistic system. Recognizing that the words we use for "things" are not the things themselves, we know we can create new words and not disturb the universe. On the other hand, having experienced the power of words, and the comfort of understanding and being understood through words, we know we are bound to more than words through our words. As Paul Tillich puts it, it is self-conscious language that gives us reason and freedom; it allows us not only to structure external reality but also to express the hidden depths of our personality (1984 General Conference of the United Methodist Church, 1984, p. 5).

Learning

Any examination of language as a mode of inquiry is affected by one's personal beliefs about and experiences with learning. In many classrooms, knowledge is seen as a static and bounded artifact, a collection of information, and a set of facts and ideas to be delineated to students through lectures and course reading. The goal of instruction is to "cover" a subject by enumerating its relevant data, with the teacher as knower recalling a body of facts to be conveyed to students who function as passive learners, receiving and storing information for later retrieval on term papers or tests.

> Learning means receiving information; knowing is the condition of having retained it, which can be measured by students' ability to report it in writing at a teacher's discretion. Teaching means turning learners into knowers by passing on to them the substance of knowledge (Knoblauch, 1983, p. 456).

In mathematics, for example, students often fall into William G. Perry, Jr.'s (1970) category of knowledge called "dualism" as described by Dorothy Buerk (1985):

> Many of our students see mathematics as the discipline where certainty is secure, where all questions have answers--answers which are known to authority (mathematician, professor, TA, textbook), where memorization, hard work, and some mystical quality called a mathemtical mind are required...[where] our subject is made up only of rules, formulas, and proofs to be memorized, skills to be practiced, and methods to be followed precisely (pp. 2-3).

This conception of mathematics as static, mechanistic, and a final product may be due in part to the way in which it is taught. Wade Ellis, Jr. (1984) suggests that we mislead our students and are "unfaithful to our discipline" in the way we teach it. He writes:

> We mislead our students by the way we present mathematics to them. Our performances in class suggest that mathematics is effortless. We answer students' questions and solve their problems with smooth, organized presentations that leave them with the impression that we never have any difficulty determining exactly the correct methods for starting and finishing a problem. We write and use textbooks that present only successful mathematical ideas. Our students are also convinced that we are magicians (p. 393).

In opposition to these views, we support a view of knowledge as the construction of meaning, where learning is active, social, dynamic and cooperative. Classrooms need to be places where learning is seen as the posing and investigating of questions; where errors are not viewed simply as faults to be remediated, but as springboards for learning; where it is acceptable for both students and teachers not to know the answer, but to continue the quest; where paradoxes and ambiguities are seen as necessary and interesting challenges to be pursued; where struggling for understanding is the norm; where knowledge is seen as constructed, tentative, pluralistic, and subject to revision; where knowledge is contextual, formed by people in particular cultures at certain times in history; where there are many ways to solve the same problem; where induction is used as well as deduction; and where the process is at least as important as the product.

Critical Thinking

The term "critical thinking" has become an important buzzword in educational circles. Indeed, part of every recent educational report, of every set of recommendations from elementary to universities, focuses on clarification and expression of thought. Literacy, itself, is no longer a matter of "reading and writing"; instead, we compartmentalize learning in relation to types of literacy: verbal, mathematical, computer, and the like. Even "thinking" has its own compartment called "critical."

Despite the seeming fragmentation, however, we find numerous attempts to integrate educational experiences. The "liberal or liberating arts," for example, are perceived once again as fundamental to the perpetuation of a democratic society. Civic responsibility and leadership are tied to the recognition that a democracy rests not in the prescription of beliefs and actions, but of the ingredients for decision making.

In some ways, the resurgence of core courses and "back to basics" may appear to be part of the never-ending cycle of pendulum swings. In other ways, however, the strong push from a variety of sources is different from similar impulses in the past. State and national reports, as well as cries from business and academe, seem to reflect an almost desperate search for young people capable of effecting positive change in today's world. The search is not the search for "cultured gentlemen," "learned scholars" or "skilled laborers." Rather, it is the search for people capable of framing appropriate questions and of leading in the discovery of possible answers. While a college education cannot ensure such citizenship and leadership, it ought to provide the basis for personal inquiry and decision making. One ought, in short, to be transformed through learning.

Thus, to us, the essence of critical thinking lies in the ability to make personal meaning. In other words, students engage in critical thinking when they grapple with knowledge in a generative and personal sense. The context for such thinking is often characterized by ambiguity and doubt. Left to their own devices, students will resist the discomfort of personal investment in learning. They need tangible means of grappling with tensions produced when confronted with new or conflicting data. When they experience a genuine need to know, created from a paradoxical or ambiguous situation, they can discover language, itself, as both a medium for thought and a model for invention.

Recent cries for graduates who can "think" and write come on the heels of some 15 years of research in the nature of writing and in thinking-writing connections. That research has strengthened the case for undergraduate "general education" and has contributed to developments in areas of critical reasoning and problem solving. While most of us as discipline-specific faculty cannot realistically become steeped in all of the "new knowledge," we can, nevertheless, benefit from a growing awareness of connections which can be made between our content specializations and general learning. More importantly, we can examine ways of incorporating strategies which enhance student learning in all disciplines.

Writing

Most of us are no doubt products of the traditional paradigm of writing--a prescriptive paradigm which is grounded in three assumptions:

1. Competent writers begin to write *knowing* what they are going to say. One who does not know is, therefore, incompetent.
2. Writing is a linear, systematic process. One forges ahead to the completion of an envisioned finished product.
3. Writing cannot be taught; elimination of errors *can*. One can learn to transcribe, edit and polish, but the "gift" is not accessible.

The logical outgrowth of such a paradigm was an approach which emphasized the written *product* as an artifact by which to measure learning. Models of description, narration, exposition and argumentation graded for "correctness" of structure, grammar and spelling consituted one's "learning." The task of the English teacher was to ensure an acceptable format had been "memorized" and to "serve" the rest of the academic community. Not only were those in the English Department attempting to teach what they (and we) assumed could not really be taught, they were also accused by the rest of the university of not delivering on their promised "product."

Unfortunately, this case is not overdrawn. The question of whether writing can be taught and learned is very much alive. Fortunately, all evidence points to the conclusion that one *can* learn to identify, formulate, invent and express ideas. Evidence points, as well, to the contextual nature of the writing-thinking process. Hence, we have witnessed a major "writing-across-the-curriculum" movement, in which writing is seen as both product and process, and in which "all" are responsible for emphasizing writing as a way of knowing.

The paradigm, not unlike Kuhn's "Structure of Scientific Revolutions," has shifted to an understanding of writing as a form of social behavior in all academic disciplines--to an emphasis on content in relation to audience, purpose and occasion. While we are excited about this movement, we see signs of a narrow view of "writing-across-the-curriculum" in which writing becomes so discipline-specific that it approximates a "how-to" mode of writing. We recognize that each discipline brings its uniqueness to bear upon inquiry. That uniqueness need not, however, be formulaic. Writing, as thinking, is a recursive process--a transforming process.

Emig (1977) discusses the transforming power of writing in relation to Bruner's theory of multirepresentational learning. According to Bruner (1966), there are three major ways to represent actuality: 1) enactive--learning "by doing"; 2) iconic--learning "by depiction in an image"; and 3) symbolic or representational--learning by "restatement in words." Emig points out the marvel of writing as a process, in that it deals with all three of Bruner's categories simultaneously, or almost simultaneously.

> That is, the symbolic transformation of experience through the specific symbol system of verbal language is shaped into an icon (the graphic product) by the enactive hand. If the most efficacious learning occurs when learning is re-inforced, then writing through its inherent re-inforcing cycle involving hand, eye, and brain marks a uniquely powerful multirepresentational mode for learning (p. 124).

Emig views writing as active, engaged, committed, and personal learning. She points out that writing is "self- rhythmed." It slows down the thinking process and promotes individual pacing and independent learning. Not only must students give up a passive role while they write, but they must also become readers and writers of their own stories. Thus, writing provides feedback and reinforcement: "the information from the 'process' is immediately and visibly available as that portion of the 'product' already written" (Emig, 1977, p. 125).

Moreover, writing requires deliberate structuring of meaning. Here Emig relies heavily on Vygotsky's "deliberate structuring of the web of meaning" (Vygotsky, 1962), for writing represents an expansion of inner speech. Yinger reinforces this integrative construction of meaning:

> By writing out what is known and by juxtaposing this knowledge with other pieces of knowledge to create new connections, new relations and structures come into being and new knowledge is created. This same process makes evident the gaps or inconsistencies in one's knowledge, which in turn may promote further learning and reorganization (Yinger, 1985, p. 25).

Experiences Incorporating Forms of Discourse in Teaching and Learning

Although research and experience support the conclusion that writing and learning are connected, that evidence in itself is not sufficient to bring about change. We must find ways to engage our students in writing as an act of discovery. At the very least, we can begin to identify more precisely the source of learning difficulties as we observe student reasoning in process. Nothing is more obvious than lack of clarity *on paper*. If we can enable our students to take the risks of "thinking on paper," we may be well on our way to preparing liberally-educated thinkers and potential leaders in a democracy.

To meet these goals of writing, we incorporate a variety of writing activities in our courses. In mathematics classes, for example, students are asked to write autobiographical narratives about mathematical experiences, told as stories, with as much detail included as possible. This form of writing is a comfortable way to initiate the writing experience, since it gives the students a chance to start with their own experience and write about something that is familiar to them. Most students are surprised and puzzled when they initially encounter the idea of writing in mathematics class. In fact, many respond that writing belongs in English class and other courses where one explores ideas and writes essays, but not in mathematics class where the content is numbers. They need an activity, therefore, that springs from experience and is similar to writing tasks they perform in other contexts. Furthermore, as students capture their feelings about and experiences with mathematics on paper, the potential exists for them to realize that the writing process can become the vehicle by which feelings and experiences are recognized, and that the written product can become a record for referral and reflexivity.

The narratives also provide a source of data about students and their experiences with mathematics. If teachers desire to know how students view and learn mathematics, they can solicit a written response to the explicit question. However, students may give a response tailored to what they think the teacher wants to hear. After all, years of schooling teach them how to play the game!

Instead, if students are asked to write descriptive narratives, they will undoubtedly catch themselves in the act of their mathematical experiences. These entries will give both students and teacher a more realistic glimpse of such issues as the students' conception of mathematics, their attitude about learning, their perception of their own abilities, and their view of mathematics classses and teachers. Thus, the autobiographical pieces are a comfortable way for students to commence process writing and also a data source for teachers as they attempt to ascertain the students' conception of mathematics at the beginning of a course.

Listen to accounts by two different students about their mathematical experiences:

> One of my most pleasurable experiences was in grade ten! I had the best math teaher I have ever had! Her name was Mrs. R.T.

> She was a petite Chinese lady who wore bright flourescent blazers and thick clumpy shoes! She walked everywhere with a little hop in her step! She was really cute to look at but everyone was a bit timid of her ways. Most students cracked jokes and didn't take her very seriously. She spoke broken English but somehow she was able to communicate to me the essence of math. You never wanted her to come too close though to answer your question one on one because she had the worst breath in the world! It was in her class that I received the highest mark I've ever attained in mathematics. I received a 75%. I even beat my sister who is literally a brainwave in all subjects. I guess this story goes to show that when a teacher is good and a student applies himself to his work, success is the end product!

> My teacher sent a note home to my parents, saying that they needed to review times tables with me, because I had not done well on the quizzes for the two and three times tables. My mom helped, and for the fourth through eighth times tables, I had memorized all of the answers correctly. It was no big deal. Well, on the day of the quiz for the 9 times tables, my mind went black. I got to 9x5=45 and I could not remember anymore. I just sat there and stared at the paper, willing the answers to appear. Then, somehow, I noticed that for each problem, you could solve it, simply by adding 9 to the previous number. Finally, multiplication clicked. I remember wondering "Why in the world didn't the teacher just explain that 9x3=9+9+9?" Instead of teaching us what multiplication meant, she just wanted us to spit out the right answers.

For both of these students, writing about their experiences revealed to the teacher underlying assumptions about mathematics and caused the student to reflect on a general principle of learning. Particularly for elementary education candidates, this writing experience may have caused them to think about learning and teaching implications that may not have arisen otherwise.

Students were also asked on the first day of mathematics class to write for five minutes on the topic "Mathematics is like..." The images produced through writing engaged students in thinking *about* mathematics, instead of *doing* it, possibly for the first time. Many students found metaphors for math in nature, as illustrated in the following entry:

> Mathematics is like trying to organize and manipulate pebbles on a beach where the sand and stone are the infinite set of numbers and the forces of sea, wind, and movement are the functions and theories of mathematics. Mathematics is as essential as the rhythms of the sea to daily life and work. Mathematics can also be like the sky. Although the sky is always there, sometimes it's

> clear and crisp--sometimes dark and stormy. The same is true for our understanding of mathematics. Sometimes it takes a bolt of lightning to clear the confusion on a concept or process. Mathematics plays a role in our daily lives just as surely as our environment, whether stormy or clear and bright, our minds and lives tend to mimic nature's cycles.

On other occasions, students are asked to engage in focused writing for a few minutes during class in response to a topic suggested by the teacher. The following excerpt is in response to the topic "Write about the muddiest issue with regard to base numbers":

> The muddiest part of bases for me is the whole concept. I can't ever remember doing base number systems. I guess it is a good thing that we talked about it in this class. I never have given basic principles a thought. It makes math seem more real to me to realize that the systems are made up by men. They are not supernatural ideals that are impossible for human minds to comprehend. Man developed them to help make things easier, not harder. I have always put math and science together as dreaded subjects put into my life to keep me in my place. But by really understanding our value system I don't feel so clueless somehow of what is going on in our text . . . I feel good about having the understanding under my belt.

Another student wrote in response to "Why should people do problem solving"?

> At first I really saw no purpose for problem solving. But now that I've been working on it, I see the value in this type of thing. Problem solving is not merely a math related activitiy. One needs problem solving skills for almost every part of life. Doing these problems merely gets the thinking process going. It helps to show us ways to at least try to work things out without simply guessing, becoming frustrated, then giving up. It helps you to develop methods of thinking that you normally don't use, and gives you a challenge.

A student in freshman composition freewrote the following entry in response to Descarte's "I think; therefore I am."

> Truer words have I yet to see. We can only base our existence on the "reality" of our thoughts. We, as individuals, know we exist. But how do we know each other or anything, for that matter, exists? We don't. Maybe the rest of the world is a habitat which your mind has set up. You can feel things, you can see things, you can hear things, but is that actually reality? Your mind is a computer board with inputs consisting of touch, sight, smell, etc.

> But your reality isn't another's reality. A blind man's reality is much different than yours. A crazy man's is different. So our reality is based on the inputs we have been allowed. All connected to the mind. Think of this. WHAT IF YOU HAD MORE INPUTS? So, you know you exist, but what about everything around you? Let's pull all the input plugs and see what happens . . . am I still "am"?

Both authors regularly use unstructured dialogue journals in their courses. Although the disciplines of communication and mathematics are different, and in fact are considered by many to have little in common, the perspectives regarding writing, shared with students on the first day of class, are strikingly similar:

> In mathematics class:
>
> A journal is a place where you can write to and for yourself about mathematics. Through writing, you can reflect upon and express feelings about mathematics and the course that affect learning, both positive and negative. You can also use the journal as a vehicle to "write to learn," by thinking on paper about mathematical concepts and processes.
>
> Journal writing is "freewriting"; that is, it is intended to be unedited, uncensored writing, and differs from the writing "product" you ordinarily submit for a grade. There is no such thing as a "wrong answer" journal entry. Simply let your pen take off and see what happens!
>
> Use your journal to think on paper about mathematical concepts; summarize the text or class discussion; write definitions, forumlas or processes in your own words; raise questions; write your way through a problem you can't solve; or record your feelings about the course, specific material covered, the teacher, homework, the book, tests, use of class time, or the nature of mathematics.
>
> Although the journal is intended primarily as a means for you to write to yourself, it can also serve as a dialogue with the teacher, giving important information to the teacher concerning how you feel about the course and material, so as to enable better use of class time and improve instruction...
>
> In composition class:
>
> While a piece of writing in its "final" form should exhibit mastery of basic elements of standard written English (that is, clarity of expression, logical organization and development of ideas, absence of grammatical "errors," etc.), those ingredients alone do not constitute "good writing." It is only as we compose our

own understandings on paper in such a way as to invite a reader to accompany us on our mental journey, that we become writers. Indeed, it is in the act of writing that we discover what we know and think and feel.

A student wrote the following journal entry in response to this description:

> Just read the course overview. I must say I am impressed and relieved by your view of writing. Most English (writing) teachers give their students the impression that writing can be a perfect art, whether they mean to or not. This always discouraged me, because I could not see how something so complex could be perfect.

Another spontaneous journal entry from a student in composition class illustrates the power of process writing to make connections across disciplines:

> I decided to take the course "The Gospel of John" the morning before it started. The instructor stressed the importance of the inductive method of reasoning in examining the course's text. He also stressed the fact that any serious attempt at learning starts with our ability to first see and examine before drawing conclusions. Two principles that he stressed were: the *law of relationship* which states "Everything written or spoken sustains some specific relation to something else" and the *law of proportion* "an author reveals his point of view, in what has been written by his comparative emphasis or omission of certain factors which always accompany development of thought." I can see where these two laws would apply just as effectively in my principles of writing course.

Other colleagues have used writing activities to engage students in critical thinking about their discipline. From music come the following examples:

> Explain a technical problem--involving some physical feature of an instrument or a piece of equipment--to another musician or apprentice of music who is unfamiliar with this instrument/piece of equipment.
>
> Imagine yourself in the following historical situation. Imagine further that you are being interviewed by an inquisitive young journalist. Write down the conversation you think might take place. You should provide an accurate account of the relevant facts; you are free to interpret the facts as seems appropriate to you.
>
> Write in your own words what______means.

> Make a list of all the questions you can ask about______.
>
> Your mother has little formal training in music, but, perhaps provoked by your use of recordings of Cage and Lentz (and your complaining comments about this course), has asked you what possible value such music has. Assume that (1) you owe a serious response and (2) you really care. Write a note in response to the question. Make reference to music of the composers mentioned, and to general trends and perspectives they may represent.

These are merely a few examples of writing activities designed to engage students in using language to make personal meaning and to think critically.

Benefits, Potential Risks, and Implications of Using Language-Based Inquiry

Benefits

As students engage in "writing-to-learn" activities, there are benefits to the student as writer, the teacher as reader, and student-teacher interaction in the classroom. The exploratory nature of writing may in fact invite students to record events, thoughts, feelings, and ideas, which the writer may not initially recognize as relevant or valuable. The mere fact of reporting them on paper, however, creates a new awareness and may induce further reflection, which can in turn be recorded through subsequent writing. The process may be further enhanced when teacher and/or peers provide feedback through their responses. Furthermore, the written product will provide a record of the writer's development through time, which can by itself provide new awareness and stimulus for reflection.

Benefits to the student as writer.

As students use process writing, learning can be enhanced in a variety of ways. Consider several benefits, along with examples of them from journal entries in a mathematics class.

Writing can have a therapeutic effect on students through the expression of and reflection on their feelings about the course, the discipline, and schooling:

> It is eight o'clock and I am sitting in class dreading math and it hasn't even started yet. As class wore on I began to realize certain aspects about math. Math wasn't afraid of me, I'm afraid of math. I noticed that I have trouble taking tests and that my attitude toward math needed changing. I hope that this is possible. I guess I'm really afraid to think.

Expressing their apprehensions about the discipline, reporting past experiences of failure or success, and communicating feelings of incompetence or discomfort about the course can help writers learn about themselves and take steps toward overcoming their perceived difficulties.

Writing can also increase students' content knowledge, by providing better understanding of the material covered in the course and the stimulus for personal inquiry into the subject matter:

> I still don't understand whether you know that a system of inequalities fitting an equation will have a maximum or not. How do you know whether it's bounded or unbounded? Is it only unbounded if it goes up towards infinity or can it be unbounded downward too?

By questioning, connecting, consolidating, inventing and restating concepts in their own words, students can use writing *to learn* subject matter.

Another benefit of writing lies in its ability to help students reflect on their processes of dealing with the discipline or on their ways of studying:

> Section 3.4 was in a way difficult to understand and do, more so because we ran out of time before you could explain it. So I sat at the table thinking of some things that might shed some light. I came up with three solutions: (1) read the introduction to 3.4, (2) graph the problem to see what it looked like and figure out how the book had done it, or (3) copy the answers from the back of the book. I knew only options (1) and (2) would help me to learn how to solve the problems whereas option (3) wouldn't help at all . . .

For students, the process of recording the way they approach a discipline can make them aware of their own procedures, possibly for the first time. With thoughts on paper, they can reflect on the merits of their habits and retain or change them accordingly. In addition, the writing becomes their own historical document of what works and fails as they learn.

Writing can also lead students to reconceive their beliefs about the nature of the discipline:

> I think that we as humans create mathematical truth as we need it. Therefore if a difficult problem comes along which can't be solved by our intuition or other skills, a math identity will be created so that a solution can be found. If math just existed independently, we wouldn't know how or why it was put there in the first place so it would be looked on with...

In mathematics, students seldom think *about* mathematics; they are trained to *do* it. By writing about a discipline, students can engage in a conversation with themselves about issues of the discipline, while providing valuable information about their conceptions about the subject.

Benefits to the teacher as reader.

As teachers read their students' writing, they receive a wealth of new information about students and the course.

First, writing can provide teachers with a powerful diagnostic and evaluative tool. Teachers can become aware of the individual needs of their students, and respond to them both individually and corporately. The writing, itself, provides a record of student development which can help the teacher evaluate the growth occurring as a result of the course.

A second pedagogical benefit is feedback on the course. If students are sufficiently comfortable in sharing specific responses to the learning activities in the course, the teacher can use this information to assess both the learning process and the learning environment. Thus writing can provide data for long-term instructional improvement.

Finally, by reading and interpreting students' writing, teachers may learn surprising information about students as well as about themselves. They may discover, for example, that most students' beliefs are at odds with their own, and that there is a language barrier in the classroom. At the very least, they will become aware of the impact of affective elements on students' difficulties with learning.

Benefits due to the student-teacher interaction.

When students write entries and the teacher reads and responds to them, a new mode of communication is created in the classroom--a private dialogue between the teacher and each student. As teachers and students come to know each other in a more personal way through writing, the teacher can become more sensitive to individual students and to their specific personalities and problems. Teaching may become more individualized as teachers provide feedback to students' ideas and concerns. The resultant positive rapport can enhance both personal and academic growth as students and teachers work in a cooperative and caring climate, rather than in an impersonal or adversarial one.

While teachers may relinquish a portion of their evaluative role as they take on a more supportive one, students are encouraged to be more daring in their attempts to learn. Moreover, the new rapport which journals can establish in a classroom can have an important effect on the teacher's motivation. In turn, the increased respect and trust which students may develop can allow teachers to get new energy for the task which first brought them into the profession--to help students grow.

Some of these benefits derived from reader-writer interaction may appear, on the surface, to be too "soft" or "affective" to measure. We know, for example, that a classroom "feels better" when we know our students and when we have engaged in extended dialogue with them. But what difference does faculty-student interaction actually make?

An extensive review of literature on faculty-student interaction reveals that interaction contributes to students' personal and intellectual development, to student satisfaction, and to student persistence.

Student development.

Frequent interaction appears to contribute to greater interest in and commitment to intellectual concerns, greater sense of personal and vocational identity, increased ability to form close relationships and influence peers, and increased involvement in campus-wide opportunities. Concomitantly, interacting faculty reap similar affective benefits; greater sense of personal effectiveness, and recognition by colleagues and students as influential, superior teachers. Relations with students is noted as "the number one satisfaction area for faculty" (Astin and Sherreri, 1980, p. 91).

Student satisfaction.

Alexander Astin (1977, p. 223) summarizes: "student-faculty interaction has a stronger relationship to student satisfaction with the college experience than any other student or institutional characteristic." Other studies confirm: "In the final analysis, a student's satisfaction or dissatisfaction, success or failure, may depend more on the quality and interest of individual faculty members than any other factor" (Carnegie, 1977, p. 78).

Student persistence.

At a time when many colleges are concerned about retention of students in the face of the predicted decline in the available pool of college students, student persistence is of utmost importance. Freshmen, in particulalr, are vulnerable as they begin to search for a sense of place in a new environment. Again, faculty-student interaction appears to be a key variable in encouraging students to persist in college. Freshman-year persistence/withdrawal decisions relate specifically to: (1) total frequency of student-faculty informal, nonclassroom contact, (2) frequency of interactions with faculty to discuss intellectual matters, and (3) quality of interaction (Pascarella, 1980, p. 559).

We know, then, that interaction makes a difference. We also can conclude from the research that significant interaction begins in the classroom. That is to say, the point of contact is the academic arena which becomes an arena of human interaction and human relationships. Faculty perceived to be concerned about issues of importance to youth and faculty who are interesting, open, available, intellectually stimulating, demanding of high quality work, and helpful in building student confidence are those with whom the most significant relationships are formed (Wilson and others, 1975).

Moreover, relationships begun in class but continuing outside the classroom may ultimately be the most powerful in students' lives. By "informal" we mean engagement in substantive dialogue over a wide range of topics, helping students integrate academic and social concerns. We cannot ignore the evidence that such "informal interaction" leads to greater satisfaction with college, higher degree of achievement on standardized tests, decreased tendency to drop out, and greater likelihood of pursuing advanced degrees (Kuh, 1981, p. 21). In sum, the students' general education is enhanced by increased "frequency, closeness, breadth, and duration of student-faculty relationships" (Gaff, 1983, p. 152). And those relationships are often begun in the context of language-based inquiry.

Potential risks

The first reaction of many teachers to using writing in the classroom is IT SOUNDS GREAT, BUT...

Concern: I have too many students to read and respond to writing from each one.
Response: Start small. Select one class and experiment with different writing activities.

Concern: I'm not an English teacher. How can I respond to grammar and writing mechanics?
Response: You don't have to. For process writing activities, grade on participation only, encouraging students to be open and creative.

Concern: What if my students won't write?
Response: Reward them for their writing by making it part of the grading scheme and giving them positive feedback. Write along with them and share your writing. Talk about writing in class, so they know your rationale for including it.

Concern: I can't take away from covering the content, and besides, wouldn't students learn more if they spent their time studying instead of writing?
Response: The choice may rest between short-term memorization of content and long-term understanding of concepts.

Besides these concerns, both students and faculty are susceptible to other potential risks when writing is used to engage students in critical thinking. Students will undoubtedly feel uncomfortable with process writing activities, since they are not accustomed to them. In fact, some students may decide that writing activities are a waste of time and may refuse to take advantage of the opportunities they provide.

Faculty also are vulnerable to initial resistence from other faculty, as well as from students. Advocating language-based inquiry may not be popular among faculty who are entrenched in content-based approaches and happy with the status quo. Additionally, when students only encounter writing and critical thinking activities in isolated courses, they may apply pressure on those faculty for deviating from the more comfortable and traditional emphasis on content.

Implications

As faculty utilize process writing to encourage critical thinking, they must be prepared for the discomfort associated with change. First, lower faculty evaluations may result initially because some course goals are discovered *in process* instead of being identified at the outset by easily measurable steps. Second, this emphasis necessitates not only a different kind of teaching, but a different kind of testing. It may require more time to think about and prepare tests which ask for application and synthesis, instead of mere regurgitation of information.

In sum, using language-based inquiry has implications for how we view learning and teaching--it calls for questioning what we have taken for granted and demands reexamination of curriculum, educational goals, and teaching strategies. It is problematic, for example, to subscribe to Skinner's notion of teaching as "simply the arrangement of contingencies of reinforcement" and "language-based inquiry" simultaneously.

We began with the premise that education depends not upon the certainty of answers but upon inquiry grounded in personal investment. As we seek to engage our students in learning that will have long-term consequences, we turn to the common denominator among all academic disciplines and among all those involved in the teaching-learning enterprise. We urge others to help students discover the generative power of language, itself. If they are to experience the transformation that comes from personal involvement with materials, ideas and other learners, they can find no easier access than writing-to-learn and writing-to-think.

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Introduction to the Liberal Arts: A Dramatic Approach to Critical Thinking

Carolyn Sobel

Like all university faculty, at New College of Hofstra University we are especially concerned with encouraging students to develop the ability to think critically, to evaluate a situation, academic or otherwise, and to communicate their analyses effectively. While we implement this approach broadly throughout the curriculum, we are especially concerned with our freshmen, whose habits of thinking are often particularly superficial or naive. To catch them early, as it were, to tackle the task immediately upon their entrance into college, we have designed a required course, which we call Introduction to the Liberal Arts. We have experimented with this course over several years, and are pleased with the success of its current version; it is this course that I shall describe today.

In order to do justice to the course, which we have been teaching with significant success for two years in its present form, I must place it within the framework of the non-traditional curriculum of New College. New College is a small liberal arts college, with a student population, apart from special programs, of about 300, within a university which has a larger, more traditionally based College of Liberal Arts and Sciences. One aspect of our non-traditional approach is the fact that our students do not major in a discipline, such as Psychology or English or Mathematics; rather, they choose an area of concentration. These areas are, at present, Humanities, Social Sciences, Natural Sciences, Creative Studies, and Interdisciplinary Studies. Students must take an array of courses within each of these and their area in order to satisfy college and area requirements for the concentration, but there are few specific required courses.

In its interdisciplinary approach to education New College also differs from traditional undergraduate institutions. Its educational philosophy, which emphasizes relations across the domains of human intellectual endeavor rather than their discreteness, combines with its commitment to innovation to encourage the development of courses which are themselves interdisciplinary. Often team-taught, these courses allow students to see representatives of different disciplines learning from each other, making connections -- thinking, in fact, right in front of them -- and enjoying it. The required course Introduction to the Liberal Arts is one such interdisciplinary, team-planned, and partially team-taught course.

Our team at present consists of a psychologist, a theatre person, a biologist, and a linguist. The usual arrangement is for each of us to supervise one section of approximately fifteen students, combining sections as our syllabus dictates, or even on the spur of the moment, if we wish.

How, then, does this course address the task of encouraging critical thinking? To begin with, we focus on important philosophical issues, such as the values which will inform their lives, the maintenance of individuality and integrity in the face of pressures to conform, the role of passion and commitment, and the threats to and benefits of good and lasting relationships. We do not approach these issues in the abstract; we introduce them by means of plays, which the students both read and see on videotape. The plays are chosen jointly by the team, members submitting suggestions for plays which relate to their fields of expertise. Plays are also selected on the basis of their ability to illuminate the issues we wish to address. For example, the biologist suggested *Inherit the Wind*, which treats the issue of Creationism versus evolutionary theory, and the conflict experienced by a young teacher as he attempts to introduce academic freedom into a Fundamentalist society. Our psychologist proposed *Equus*, whose theme concerns the "curing" of a boy whose passion is perceived by society as perverted. I, a linguist, proposed *Children of a Lesser God*, in which another young person confronts pressure to conform, in this case because her reliance on signing sets her linguistically apart from society. Each play reflects, in its own way, themes we wish to focus on. In addition, we assign supplementary readings to accompany each play; these address the same issues, but are drawn from a variety of sources very different from the plays. For example, we have assigned an article entitled "Creationism in Schools: The Decision in McLean versus the Arkansas Board of Education," from the February 18, 1982 issue of *Science*, as one of the readings to accompany *Inherit the Wind*. We chose excerpts from Rousseau and Freud dealing with the nature of humankind to accompany *Equus*, and an article by Ursula Bellugi on "Language Structure and Language Breakdown in American Sign Language," appearing in *Psychobiology of Language*, edited by Michael Studdert-Kennedy (MIT Press, 1983). Students are thus guided to an appreciation of the different approaches which may be taken to issues which have long concerned thinkers, and about which it now behooves *them* to become concerned.

In class discussions, facilitated by the fairly small number of students in each section, the students present their views on the issues as exemplified in the plays and as treated in the ancillary readings. Part of the instructor's task is to pinpoint fuzzy reasoning when it is demonstrated in these discussions, to draw attention to the voicing of unsupported opinions, to encourage comparisons and contrasts across the various materials being read, and to help students to analyze and synthesize what they are reading and learning. It is our experience that students learn from the example we set, and, as soon as they become comfortable with the format, begin to challenge each other as we challenge them.

The ability to express one's thoughts clearly, coherently, and correctly is at once an aid to and an important outcome of critical thinking. Therefore, in a series of writing assignments, our students address specific questions put by the instructors, one such writing assignment accompanying each play and its associated ancillary readings. These they submit both to the instructor and -- anonymously -- to the section as a whole, for criticism in workshop sessions. Hearing their own papers read aloud by classmates, who stumble over or stop to reread what the authors have not expressed clearly, calls attention to their writing problems. Often the author's pen is just as busy noting trouble spots as the paper is read as are the pens of his or her classmates, who will be called upon to comment on it. And comment they do. Our experience is that once the group begins to trust that it is the writing that is being criticized and not the class members, most participate willingly and seriously. They call attention not only to flaws in sentence structure and mechanics, but to un-thought-out generalizations, unsupported claims, faulty logic, manipulation of the reader, and evidence of the writer's having accepted cant and empty slogans. Their favorable comments, which are also reasonably specific and which are sprinkled throughout the process, provide reinforcement for the author. All of this is convincing to the participants, many of whom report to us, via routine evaluation forms at the end of the semester, that the workshop sessions are among the most valuable aspects of the course. From our point of view this activity also receives high marks; we see considerable improvement in the papers over the course of the semester.

I have of necessity chosen only certain elements of the course to present today.* There is, naturally, more involved than we have time to discuss; for example, there is the benefit of seeing how different disciplines approach the same issues. There is also an opportunity for students to write an imaginative paper in addition to the expository work I have mentioned, and a term paper designed to introduce them to techniques and challenges of research. But a major focus is on critical thinking, and we judge the course I have described, which results from many hours of planning over several years of experimentation, to be successful in fostering it.

*A more complete description of this course is available on request. Please send requests to me at Barnard Hall, Hofstra University, Hempstead, NY 11550.

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Critical Thinking via Critical Writing: The Cross-Disciplinary Case and the Case in Classics

Charles J. Zabrowski

The presenter of this paper is not a specialist in critical writing or thinking, but a classicist by profession (and a Hellenist by preference), who has long taught courses in Classical Literature in translation, Classical Mythology, and Greek and Roman History, in addition to courses (at the basic, intermediate, and advanced levels) in the Greek and Latin languages. He must, by way of preface, note that in the teaching of the ancient languages themselves there are no discretely elaborated techniques for communicating the skills of critical writing and thinking, except insofar as that the traditional processes for learning the languages (which, it should be remembered, are no longer spoken on a quotidian basis, but must be dealt with almost as a sort of linguistic mathematics) in themselves supply that training, consisting, as they do, not only in the memorization of forms, but also in the oral and written use of those forms to build significant semantical structures (i.e., sentences) in Latin and Greek, a practice that leads to a very critical discernment (relying on the exact distinction of nuances and connotations, as well as of idioms and denotations) of what is more appropriate, and what less, in any given instance where judgment must be exercised. In other words, the very learning of Latin and Greek by reading aloud and writing puts continuously into operation those aptitudes, the achievement of the mastery of which, is the subject of this Conference, a fact well known to all competent teachers of Greek and Latin for upwards of two millennia. But we live in a comparatively (the presenter had almost said predominantly) Greek- and Latin-less world, and the problem we face today is how to communicate those abilities in the students' native (or at least the preferred) tongue.

In this connection the presenter taught at his present institution, for the first time in the last academic year (1987-1988), an interdisciplinary course required of all freshmen (the Gettysburg College Freshman Colloquy) that was intended to provide them with a *common* intellectual experience, and designed to expose them to critical thinking by reading, reflection, discussion, and writing on seminal works in five areas of important social and political change, all subsumed under the heading 'Revolution'. These areas were; the College Experience as Revolution (as marking a sort of *rite de passage* from high school), the Gender Revolution (focusing on the change in the social and economic as well as the political status of women in the past one hundred years), the Scientific Revolution (more specifically the Darwinian theory of evolution and its effects on the general view of the origins of the world and the human species), the Artistic Revolution (more particularly the change in sculpture from the representational to the abstract), and Political Revolution (this last dealing with events in Iran since the nineteen-seventies, and with their root causes and ramifications; in prior years the French Revolution had been used as a *locus*).

This year the general theme of the course has been changed to 'Knowing', but the cross-disciplinary emphasis has been maintained. (It should be remarked that the course is cross-disciplinary not only in content and approach, but also in staffing: something in the neighborhood of twenty sections are offered each semester, with instructors coming from all the academic departments of the College [from Anthropology to Zoology, and every field in between], rather than from a pool of specialists in critical thinking and writing. In this connection the presenter will note that he has not yet taught the course in its new incarnation, but will do so next year; he has taught it twice under the rubric of 'Revolution'.) Towards the end of each segment of the course (the readings having been first addressed by one page hand-written papers and journal entries to form a basis for discussion), a five to six page paper on a synthesizing topic was assigned. Each was returned, after grading, at an individual student- instructor conference, *and re-assigned for a second version.* This provision of a second version (to improve not only writing and organization, but also intellectual content) is part of the syllabus, and was a novel idea to the presenter, if so he may put it. But so successful were the results that he has decided to adapt it to his courses in Classical Literature in translation and Classical Mythology. The former course entitled, 'The Idea of the Hero in Ancient Greece and Rome,' has for its aim to trace the nature and development of the idea of the hero (female as well as male) and the heroic in the ancient world by the reading of a large selection of Greek and Roman literary works in translation, in their entirety, in the genres of Epic, Tragedy, Comedy, Philosophic Dialogue, and Satire. (These works are: Homer's *Iliad* and *Odyssey* [in R. Lattimore's translations; the Iliad, Chicago: Phoenix Books (University of Chicago Press), 1965; the *Odyssey*, New York: Harper Torchbooks (Harper and Row), 1965], Aeschylus's *Agamemnon, Choephoroe* [*Libation Bearers*], and *Eumenides* [*The Oresteian Trilogy*, translated by P. Vellacott, New York: Penguin Books, 1956], Sophocles's *Oedipus Rex*, *Antigone*, and *Oedipus at Colonus* [The Oedipus Cycle, translated by D. Fitts and R. Fitzgerald, New York: Harvest Books (Harcourt), 1949], Aristophanes's *Clouds* and *Birds* [from *Four Plays by Aristophanes*, translated by W. Arrowsmith, R. Lattimore, and D. Parker, New York: New American Library (Meridian Classics), 1984], Plato's *Apology of Socrates* and *Crito* [from *The Last Days of Socrates*, translated by H. Tredennick, New York: Penguin Books, 1954], Vergil's *Aneid* [translated by L.R. Lind, Bloomington: Indiana University Press, 1963], and Juvenal's Satires [translated by R. Humphries, Bloomington: Indiana University Press, 1958].) While the course is thus not, technically speaking, cross-disciplinary, it *is* 'cross-genre', and the works read are sufficiently disparate, socially as well as chronologically, to bring up a variety of contrasting points of view. Five fairly short critical essays (four to six typed pages, double spaced) on specific topics are assigned, generally after the readings in each genre. These essays are reflective as opposed to research papers, requiring the demonstration of an understanding of the texts concerned, rather than the manipulation of secondary sources. (Optional critical readings are provided by the instructor [via the library's reserve shelf] for the students' use.) They thus already conform to the Colloquy model as to kind. The instructor now intends to grade and return them for further refinement, with the purpose of improving the students' abilities at written comunication, and critical analysis, by repeated practice. As to the Colloquy practice of having the students write one page papers or journal entries on the contents of each work while it is being read, it has always been the presenter's custom in the 'Hero' course to provide the students with questions for reflection and discussion in connection with each piece (or section of a longer piece: e.g., the *Illiad*) being studied, which questions he then repeats in the following class to students chosen at random, inviting, and if necessary prompting, a general discussion of the answers. In future offerings of this course, or one like it, the instructor will direct the students to prepare short *written* answers to those questions, with a view to the more likely prompting of well-considered responses (and, parenthetically, to guaranteeing that assignments have been prepared in timely fashion, for it is impossible to formulate a written reply to such questions as what several persons become angry in Book I of the *Illiad*, and *why*, or in what way is the Clytemnestra of Aeschylus's *Agamemnon* heroic, without first having thoughtfully persued the works that give rise to them.) The presenter is currently thinking along the lines of collecting and marking these short written responses after class on each occasion that they have been requested. The idea of a running journal does not seem to him appropriate in this sort of course, though he remains open to suggestions from his colleagues on this point. In the latter course (Classical Mythology) the presenter has usually assigned only a single critical essay (generally on Sophocles's *Oedipus Rex* or *Antigone*) in a single version, and relied otherwise on multiple choice and essay examinations. This traditional and fairly static approach has in large measure been dictated by the courses' inherent structure: it is necessary to read and digest a good deal of information about the contents of the myths (or such has hitherto been the instructor's view), a procedure that demands a textbook (nor has the presenter yet become sufficiently adventurous to rely directly and immediately on an ancient source [e.g., Apollodorus's *Bibliotheca*]), but the textbook he has always used (Morford and Lenardon's *Classical Mythology*, 3rd edition, New York: Longman, 1985) has the advantage of containing large chunks of original material in translation (including a good part of Hesiod's *Works and Days* and most of Euripides's *Bacchae*), and he has likewise always assigned Hesiod's Theogony (translated by N.O. Brown, New York: Bobbs-Merill [Library of the Liberal Arts], 1978), as well as Aeschylus's *Prometheus Bound*, Sophocles's *Oedipus Rex* and *Antigone*, and Aeschylus's *Agamemnon* (the plays in that order; all are to be found in *Greek Tragedies*, vol. 1, translated by D. Greene and R. Lattimore, Chicago: University of Chicago Press, 1960) for treatment in class, and Ovid's *Metamorphoses* (translated by M. Innes, New York: Penguin Books, 1955) as required background reading (i.e., to be tested in the multiple choice sections of examinations). (Another factor has been class size: the 'Hero' course tends to attract fifteen to twenty students with a serious interest in literature [Colloquy is always seventeen or eighteen]; the

Mythology, by contrast, offeres as a pure elective, generally draws upwards of fifty students, of quite diverse backgrounds, interests, and levels of preparation [being in this, at least, more like the Colloquy than the literature course].) It is his intention to assign topics on the four complete plays, at least, for short critical essays to be twice written. If this proves manageable (the course is scheduled for this spring), and if he has any time left, he may add the *Theogony* in a future offering. The presenter believes he has also hit upon a method to assure the reading of the *Metamorphoses* by the students without resorting to what he has come to consider the comparatively useless and self-defeating device of multiple choice examinations (and to prompt a minimal degree of reflective integration of its contents with the material specifically covered in class) by adapting another practice used in the Colloquy: that of a journal summarizing the contents of Ovid's work, book by book (there are fifteen such of the classical sort [i.e., about the length of a chapter in a modern piece] in the *Metamorphoses*, and co-incidently fifteen weeks in the College's semester), to be collected and graded at periodic intervals (as announced by the instructor).

In addition to the foregoing courses in Classical Literature and Mythology the presenter also teaches on a regular basis (the fall semester every other year; he is, in fact, teaching it now in the fall of 1988) the College's course in Greek History (CLC 251-from the Neolithic Period to the death of Alexander the Great [323 B.C.], with a short glance at Hellenistic and Roman Greece), given as an upper level offering for History and Political Science as well as Classics majors, and as an elective fulfilling the College's distribution requirement in History/Philosophy for students of at least sophomore status. (The course generally draws about two dozen, almost exclusively juniors and seniors, who have first call on the twenty places listed; the instructor may admit a few more at his/her discretion. The presenter currently has the normative twenty-four.) In this case it may be presumed not only that all the students have done the Colloquy and a writing course (the latter, like the former, is a freshman requirement), but also that their interest is, if not on the level of a major, then certainly more than casual (there are more traditional courses with lower numerations in American and European History that fulfill the requirement), and in fact most will have already taken one or more courses in History. These circumstances seemed to the presenter to preclude the setting of critical essays of the sort envisioned for the Literature and Mythology courses, since the nature of the course virtually demands the perscription of a major research paper (twelve to fifteen pages) involving the relatively sophisticated handling of multiple secondary as well as primary sources.

Having pondered his outline (which was made up during the summer on the basis of earlier offerings), the presenter thinks he has hit upon a way to hone (or, where necessary, to introduce the practices of) the somewhat higher critical skills needed in this course, again with thanks for the inspiration to his experience in the Colloquy. In addition to a lively and readable text (A.R. Burn's *Pelican History of Greece*, revised edition, New York: Penguin Books, 1982) and two books of primary written sources in translation (the selections from Herodotus and Thucydides in M.I. Finley's

Portible Greek Historians, New York: Penguin Books, 1977, and Plutarch, *The Rise and Fall of Athens*, translated by I. Scott-Kilvert, New York: Penguin Books, 1960) the instructor has also always employed a volume containing scholarly elaborations as well as primary material, D. Kagan's *Problems in Ancient History* (vol. 1: *The Ancient Near East and Greece*, 2nd edition, New York: Macmillan, 1975), whose modern pieces seem to have been chosen not only because of their deep delving into the *arcana* of the historical data, but also because of their tendency to contradict each other on the basis of the same evidence. The presenter has therefore initiated the practice of having the students write outlines of the articles in each section, from which they are asked to try to discern (and to note down) *how* divergent conclusions are reached from identical data, or data but little altered from one writer to another by the intervening discovery of a very few additional archaeological or documentary facts (as in Section IV, where Pendelbury [#3] and Dow [#4] assign the hegemony of the Aegean to different peoples, while Palmer [#5] re-interprets the evidence to arrive at a view different from both, or Section V, where Ventris and Chadwick [#5] on the one hand, and Page [#7] on the other, use the same set of written tablets to draw variant pictures of the same society, again to be mediated by Palmer [#9]). The presenter has had the students argue orally in class from their outlines towards a deeper understanding of the problems involved. (It should be noted that these outlines are collected and graded.) He has likewise modified the course outline to introduce a provision for a double submission of the term paper (given the nature of the case, the first version will not be graded, but returned at an individual conference with pointers for improvement as to both form and content), the first draft to be submitted by the tenth week of the semester (topics have likewise been determined at individual conferences, based on a list of four dozen possibilities circulated by the instructor).

The presenter has had encouraging results from the use of the problem outlines, and is hopeful of an increase of quality in the term papers. He thinks also that he may have ground to be sanguine about the techniques adumbrated for the Literature and Mythology courses, but in all cases invites the comments and observations of his colleagues. (A final note: Copies of the outlines for all the courses mentioned in this paper may be obtained from the presenter. by writing him at the Department of Classics, Gettysburg College, Gettysburg, PA 17325.)

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Writing to Learn

Freda Hepner

The Writing Department at Brookdale Community College, in Monmouth County, centers its program on the basic premise that writing stimulates students to question, to wonder, to discover and to organize information into meaningful contexts. "Research Writing", a second semester course offered at the college, is an interdisciplinary course which requires students to use language (discussion, reading and writing) as academic discourse for developing a research project.

The original course was conceived by Trudy Ditmar, in 1980, in conjunction with faculty members from a variety of disciplines at the college. Since that time, the course has been, and continues to be, developed by interested teaching faculty who meet on a regular basis to brainstorm new approaches to the disciplines and to develop new units for students to explore.

The course was planned to require five complete projects, each related to a different and specific academic discipline; i.e. Anthropology, Photography, Law, Natural Science, and Psychology. Most classes today, however, while following the same writing/learning process, find four well-defined projects more practical. Some of the projects evolve from current concerns and interests; i.e. a unit on drugs as a social problem, the role of the media in American life; or this year, of course, the issues in the Presidential election.

Let me illustrate how the process works by telling you about how I developed a unit, last semester, when we were in the midst of the primaries, around the election issues. This is a good example of our process because it stimulated student interest, provided a context for learning new research skills and encouraged critical thinking through the use of writing.

The beginning of any new project is a reflective journal in which students are encouraged to write what they think or feel about the subject. In this case, they were asked to list all the issues they felt were important in the election, the issues that would determine how they would vote. Before discussion began, they were then asked to order their lists by preference. Several students had only one item in their journals, while some had lists of ten or twelve. During the sharing period , I wrote their "short-listed" issues on the board. There might have been twenty five different issues which ran the gamut from Star Wars to abortion to the plight of the homeless to the national deficit-much as the campaign itself was proceeding. The students then, looking at this list on the board, discussed how they might combine certain areas of concern. For instance, the issue of taxes related to the issue of the budget deficit and the whole cosmic question of national priorities. They perceived the concerns about national security in relation to the I.N.F.

Treaty and the Star Wars initiative. Their assignment was to monitor their "top" issues in the press reports of the campaigns and to bring these news articles to class. They were also to read about the President's responsibilities as delineated in the Constitution and decide what role he could play in dealing with their issues.

At the next class meeting, the list of major issues had shrunk to seven. Students met in small groups to share their information. They were surprised that the President's role was constitutionally so limited and were able to make some astute observations about the "power of persuasion" that came with the office. Following the small group discussions, I asked them to reflect, in their journals, about these issues. What, I asked, would determine, bottom line, how most Americans would vote? The general discussion that followed led to an awareness of special interest groups, one issue constituencies, the lack of voter education, and a number of other matters that research has found determines the results of national elections.

To enable students to have first hand experience with the gathering of this kind of voter attitude data, I suggested that the class poll the voters in eastern Monmouth County to discover what issues would decide how they would cast their votes. I had arranged for an expert from our College research office to visit the class and discuss the various polling procedures that are used for different purposes. The class decided that the most practical method would be a random survey. Each small group developed a question for the survey. Framing appropriate unbiased questions took much more time and effort than the students had imagined it would. When each question was put, by the members of the small group to the whole class, there was agreement on seven questions and students were sent off each to survey at least ten members of the community.

We corollated the results the next week. Students wrote reflective journals about the experience of surveying and shared these with the class. They were then asked to write, what Peter Elbow calls, a "think piece" (a kind of extensive freely written journal) on how they thought their "top" issue would effect the results of the election. These writings were shared in the small groups. Peers were asked to help each student develop a subject, related to the issue, for further research. Subjects and issues were reviewed with the instructor for clarification and modification. Some of the subjects revolved around the history of a national problem, some involved the viability of a candidate and some were about the election process; i.e. the role of the press, debates, the problems of minority candidates, etc. A relevant article was distributed and students learned how to take notes; what related to their subject, what was factually documented and what was inference. They were taken on a tour of the library and requested to conduct further research on their topics for homework.

During the next class, the students reflected, in their journals, on their research processes, successes and frustrations. They began to cope with the requirements of documentation. They reviewed all their sources and wrote a comprenhensive synthesis journal during which they discovered where their data coincided and diverged. This journal is crucial to the process because it provides them with an opportunity to analyze and evaluate information and helps them develop ideas for organizing a presentation. Another class visit to the library gives the instructor a chance to help them find additional information that their journals indicated were needed. They are also asked to browse through the periodical section and find an appropriate publication to serve as audience for their papers.

The students are now ready to write a paper on an election issue they feel strongly about. They are asked to write a persuasive article for publication in the periodical of their choice. These first drafts are reviewed by peers, in small group workshops, and by the instructor. The written feedback is in terms of the clarity of the papers, the cogency and documentation of arguments and the appropriateness of the designated readership. Suggestions for revision are offered and these may be incorporated for a grade.

This methodology serves several purposes.

1) Writing serves as to facilitate learning, communication and cultural awareness. Writers in the the writing/learning workshop engage in thinking, writing, discussions, reflections and sharing as they learn about the subject matter, about themselves and about each other.

2) The collaboration in the writing/learning workshop serves to improve skills in writing, in learning in the disciplines and in critical thinking. Students make connections between discreet areas of study and are better able to internalize what they learn for future use.

3) Students learn effective research methodologies, library skills, and most importantly, how to organize and evaluate data to present to appropriate audiences for different purposes.

This course has been so successful that it has served as a model for a three year college-wide project, funded by the Department of Higher Education, in Learning Through Writing. Faculty in all the disciplines have participated in the project and have found that students are more successful in the disciplines when they use writing as a learning tool.

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Introduction to Critical Discourse

William A. Yaremchuk

The age in which we live thrives on the production, presentation, and reception of messages--advertisements, speeches, pleas for charity, group discussions, broadcast news, talk shows, interpersonal encounters, and presidential debates. With such a bombardment of messages, we often become numbed and begin to passively accept or even ignore most of these communications. As listeners we listen poorly--getting small bits of information. We, as people, are considered information- wise, street-wise, and even fashion-wise, but our public and private discourse can be found wanting.

Over the years our uncritical acceptance of ideas has been characterized by numerous cliches. For example, how many times have you heard that someone bought or sold the Brooklyn Bridge?

Why has P. T. Barnum's alleged pronouncement "There's a sucker born every minute" persisted? Why do we act as if "*caveat emptor*"--the buyer beware--is the center of our business and professional ethics?

The preponderance of uncritical acceptance and the decline, if not possible death, of public discourse in America suggests a need for vigilance and critical scrutiny of the messages permeating our lives. Lincoln's quotation that "You can fool some of the people some of the time, but you can't fool all of the people all of the time" might be recast for the 1990's as "No one should be fooled by communication all of the time or even some of the time." The study of critical discourse can effectively prepare one to deal with the message explosion of today.

What is Critical Discourse?

Before one can develop the skills to critically receive and analyze written and oral communications around us, first we need to understand what critical discourse is as a concept and secondly, how it operates as a series of pragmatic, practical skills.

Discourse traditionally has been defined as the communication of ideas or information usually through speaking or writing. Often the term has suggested a lengthy, boring treatment on a subject, such as a lecture, speech, research report, political essay, or dissertation. An archaic definition of discourse included the ability to reason, to logically analyze, to systematically weigh and consider before acceptance. Unfortunately, rarely would we think of the term "discourse" in this sense.

For the purposes of this article, discourse will be defined as oral and written communications. Any attempt on the part of a communicator to present a message, argument, or statement would be included. Specific types of discourse to be considered within the context of critical discourse would include: public speeches, arguments, panel discussions, persuasive appeals via personal communication and advertisements, editorials, print and broadcast news, and interpersonal messages which seek to gain acceptance from the receiver of the message.

The term "critical" is described as a systematic attempt to analyze and assess objectively. This process of analysis and objective judgement seeks to weigh and consider the advantages/disadvantages, strengths/weaknesses, validity/soundness of a selected argument, speech, or written message.

Critical is not used in the sense of fault-finding, captious, caviling, carping, or as a series of petty faults or personal gripes. Critical also is not used to represent dangerous, risky, volatile, anxiety-producing, or crisis-generating. To be critical or to be a critic comes from the Greek term *kritikos* and *krites*. These terms mean to judge, to discern, or represents someone who expresses an opinion based upon specific standards of criteria for evaluation. For the purposes of this article, critical discourse, then, can be defined as the method by which an individual logically, systematically, and objectively analyzes and assesses oral and/or written communications.

Data Brief #1.1

"critical:" systematic attempt to analyze objectively and assess logically

"discourse:" any oral or written message which seeks to gain the acceptance of the listener

"Critical Discourse:" a course of study designed to develop skills to logically, systematically, and objectively analyze and assess written and oral messages.

What is critical discourse as a course of study?

Critical discourse as a course of study seeks to provide students with an academic opportunity to accomplish seven major skills. These skills include:

1. the ability to recognize the structure and function of an argument;

2. the ability to construct a logical argument;

3. to develop skills for recognizing fallacious arguments;

4. to master the art of presenting argument in a logical, but persuasive manner;

5. to understand the role of argument in free society's public discourse, whether during a business meeting, classroom, private conversation, or public speaking;

6. to develop skills in decision-making and problem-solving within a group setting;

7. to master the skills inherent in the preparation and presentation of oral and written messages for use in private and public settings.

Overall, the student of critical discourse will learn to become a better problem-solver, decision-maker, group panelist, and an effective oral presenter. The student will be able to prepare, construct, and defend arguments presented in various group and debate-oriented settings. Not only will the student's preparation and presentational skills be developed, but also analytical and critical thinking skills.

How does one develop skills in critical discourse?

One can develop skills in critical discourse by being involved in three principal activities: (1) mastering information regarding group process, informal logic, presentational skills, problem solving, and analytical skills; (2) the systematic practice of these skills, such as constructing arguments, presenting an argument in a debate, using data in a discussion, identifying arguments in oral and written communications, and working on problems in collaborative group settings; and (3) through observation, assessment, and evaluation of messages presented in class as well as in out-of-class observations.

What specific activities will a student of critical discourse engage?

1. Participate in a Lincoln-Douglas type debate.

2. Present several one- and two-minute arguments.

3. Conduct and participate in several panel discussions.

4. Submit written exercises in informal logic.

5. Participate in major collaborative problem-solving project with final panel presentation.

6. Evaluate and assess classroom group decision-making and problem-solving exercises.

7. Play the five major roles in problem-solving process: leader, recorder, devil's advocate, spokes person, and evaluator.

8. Demonstrate basic knowledge and skill in the use of parliamentary procedure.

9. Attend and evaluate one public affairs presentation on campus or within the community.

10. Conduct library search to gather necessary resources for presentation in various communication settings.

About this course

This course has been organized to meet the three previously- cited methods of learning critical discourse: mastery of content, guided practice, and systematic observation and assessment. First, the course examines group process, decision-making, problem-solving, structure of argument, types of reasoning, and fallacies. Next, the skills of message preparation with emphasis on group panels/debates, and problem solving exercises as a means of practicing critical discourse skills are clarified. Finally, the listening process, methods of recording messages, and the analytical techniques for determining the validity of argumentative and logical messages will be examined.

As a target of millions of communication messages, we need to be equipped to meet an information-overloaded society in a logical, systematic manner. Critical Discourse will provide a method for survival as we approach the twenty-first century!

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Critical Thinking and Language Contexts

This section presents papers concerned with the purpose for which language is used, and with criteria applicable in different language contexts. Papers by Dorothy Berleth, Vivian Rosenberg, Alan Boye, William Carroll and Jack Furlong, and Joan B. Stone are included in this section.

Dorothy Berleth, in *Critical Thinking and Literative Language: A Dangerous Area to Neglect* suggests different purposes of language. She distinguishes between two uses of language: one the language of empathic response and the other the language used to "get on with the work of the world," the language of literature as opposed to the language of science, of fantasy as opposed to reality, of complex motive as opposed to isolated fact. In a world in which children interact with disembodied, even computerized voices, and read "to find out what happens in the end and be done with it," there is a special need for attention to developing children's auditory imaginations. She suggests that literative language develops concern for others, and that students must be taught to respond to more than a story line.

The necessary focus on verifiable "facts" in science and on reason in expository argument, she implies, must not be applied to literative language. In terms of critical thinking, her argument suggests that children be taught to distinguish between literative and scientific language, learning the criteria for making this distinction, and learning to respond to them appropriately in their different contexts.

Like Berleth, Vivian Rosenberg, in *Cultivating Emotional Intelligence: Strategies to Facilitate Critical Thinking,* approaches critical thinking through the strengthening of empathy and insight into human behavior. Rosenberg suggests that empathic skills develop through the awareness of emotional states, and that "in those courses in which human behavior is an integral part of the course content," these skills can be explicitly addressed.

Alan Boye, in *Teaching Literature as Rhetoric: Critical Thinking Through the Study of Language* argues that a systematic rhetorical approach to literature should be used by English faculty in order to increase students' abilities to read and think critically. He distinguishes among the "three main goals of discourse, as traditionally taught- persuasion, representation of reality, and self expression-" and adds the "creation of a form, an object of beauty through the use of language."

Boye emphasizes the differences among the purposes of written language, and cautions against a "confusing application of various approaches." Distinguishing "art from advertising," he argues that literature should be taught as a study of specific rhetorical forms, involving students in an awareness of form and the criteria, such as unity, appropriateness, and internal logic, for evaluation of form.

In contrast, William Carroll and Jack Furlong, in *Informal Reasoning in Literature Courses: The Text as Moral Laboratory*, describe a different approach to critical thinking in literature instruction, with a particular emphasis on making "students'" thinking about moral issues less egocentric, rigid, impulsive, and more sensitive to ideals of culture." Literature is used, in addition to other goals, as a "superb occasion to teach students the craft of thinking--especially developing in them the habit of thoughtful reflection on their own behavior."

Joan B. Stone raises issues about the situation of deaf students learning mathematics in *The Pedagogical Implications of Normalization and Representation in Mathematics Learning.* According to Stone, "language difficulties are a major consequence of deafness. That language functions as a tool of resistance and domination as well as a tool of cognition further complicates the situation of deaf individuals. When we situate all of this in a context of technical education, a foundation of which is mathematics, we have an incredibly complex problem."

Critical Thinking and Literative Language
A Dangerous Area to Neglect

Dorothy Berleth

Last year subscribers to *Games* magazine were startled and foolishly flattered by a quiz asking, "What Famous Person Lives At This Address?" There, among such illustrious addresses as 1600 Pennsylvania Avenue and 10 Downing Street, was my own, 8 Evergreen Lane.

And a junk mail firm routinely threatens me: Mrs. Berleth-- If we don't receive your order in the next two weeks, this catalog of values will no longer be coming to 8 Evergreen Lane. Such 'personalized' messages are becoming as common as circulars addressed to Occupant. Computer capability is fast rendering the personal touch impersonal.

I routinely receive telephone solicitations which are computer-generated. I can interact with a voice unattached to a fellow being at the other end.

I can deposit and withdraw my money without ever seeing or speaking to a bank teller.

A computer analyzes my car's intestinal problems--and my own.

Science enables these things and a host of other marvels to be. And science relies on science language--precise, objective, tested and testable. And it moves our interactions further into the realm of the impersonal.

The language of science is a can-do language. Its problems, equations, formulae need no translations to the initiated. $A^2 + B^2 = C^2$ does not require me to know your language. It does not require me to know you, to have ever seen or talked with you. It does not require me to care about you. It does not even matter if I like you or hate you or feel unspeakable contempt for you. Science language will still enable me to get on with the job at hand.

And it is precisely in science language's being like this that I believe that people concerned with critical thinking have gone a deadly deal wrong. Precisely because science language can be examined--coldly, rationally, cleanly, if you will--with quantifiable results, that our critical thinking efforts have focused on it.

I would like to take as my thesis today the following: We have done precious little in critical thinking to teach our children to respond accurately to a different kind of language--a language that Wendell Johnson named *literative language.* I am *not* talking here about the appreciation of literature. That our children spend more hours weekly in front of a television than they spend in social interaction is sad--but not the point. That less than half of our adult population admitted to not reading at least one book in the past year is bad news--but that's not the point either. To state that the reading of literature in any form is a frivolous waste of time comes closer to the point, but it is still not the point I wish to make.

My point is this: My students read with only one purpose--to find out 'what happens in the end' and be done with it. Thus Robert Frost's poem *"Stopping by Woods on a Snowy Evening"* is dismissed as "this guy sits in the woods during a snowstorm and then goes home."

Our children are trained to get the facts, to examine the research, to test the conclusions, but they are not trained in the skills that literative language requires.

Literative language is affective language. It requires the reader to respond at levels other than the coldly intellectual. It demands emotional, gut-level responses. And our children need to develop the skills which enable them to make such responses. If science language is what enables us to do the work of the world, literative language creates the feeling-state that makes us care about how our doing this work affects ourselves and others. Literative language creates the climate in which we seek to cooperate, to consider others, to care. Only if we can successfully establish this climate of cooperation, this *caritas*, this caring for our fellow human beings, can we hope our species will continue.

A major component of literative language is auditory imagination. Auditory imagination is that ability to 'hear in your head' the voices of the speakers you read. It is the ability to 'try out' the inflections, the tones of voice, and to 'hear' the voice closest to the author's intent. How does Hemingway, at the end of *"The Short Happy Life of Francis Macomber,'* intend the reader to *hear* Robert Wilson's comment, "That was a pretty thing to do"? Margot Macomber has just accidentally-on-purpose blown off the back of her husband's head with an elephant gun. Should the reader take the sentence as a compliment or as biting sarcasm? The reader needs to hear Wilson's tone of voice.

And only practice in using the auditory imagination will make this possible.

We *must* develop or rekindle auditory imagination and the other skills required in reading literative language. And we must have people trained to do so and committed to the notion that it is vital that it be done.

Young children who are fortunate enough to be read to regularly at home enter school with their auditory imaginations well developed. They have voices in their heads to call upon to hear the Baby Bear squeal, "Someone's been sleeping in my bed, and here she is!" And they hear a different voice when the wolf in Grandma's nightclothes leers, "All the better to eat you with, my dear."

Children delight in the silly rhymes and rhythms of Dr.Seuss. Without any discernible effort, they store story-poem after story-poem in memory, to take out and say aloud for their own amusement.

Dr. Seuss even teaches a code of ethics, of values, of responsibility and caring. Children love the poetic justice that rewards Horton the Elephant when the egg he has cared for as surrogate bird-mother for fifty one weeks begins hatching and "out of the pieces of red and white shell, from the egg that he'd sat on so long and so well, Horton the elephant saw something whizz! It had ears, and a tail, and a trunk JUST LIKE HIS!" Scientific this is not. Realistic this is not. But it *is* justice, and it is right.

If children begin (or can begin) early to respond to literative language, why am I pushing the panic button, sounding the trumpet? What happens that arrests this development? What happens? School happens. The children must be taught to read.

As the child begins to learn to read, he first reads orally--just so the teacher can determine that he *is* reading. Is he making the words we do out of the chicken scratches on the page? However, rapid word recognition and reading through the sentence-unit is the goal, and comprehension questions test whether the child knows 'what happened.'

Quickly the child is moved along to silent reading and is admonished not to move his lips. Later he is admonished not to vocalize. In the interests of speed and efficiency, the child is trained to have the printed page 'main line' from the eyeball to the comprehension center of the brain. Auditory response is unexamined (and therefore is not valued), and gut-level reactions are ignored--they're not necessary.

And this teaching focuses reading skills on science language--the abstraction of facts to get on with the work of the world.

What is lost? The skill of interpreting literative language is lost. The habit of empathic response is lost. The *value* of being able to get inside another's skin, to respond "I know just how he feels" is unrecognized, unvalued and unrewarded.

When that is lost, the climate that predisposes us to want to cooperate, to care, is lost. And when we lose this, we endanger our children's future and the future of our species. Our one hope for survival demands empathy, concern for others beyond self, *caritas*.

It's a damning commentary of our times that we have to be *taught* to feel. And we desperately need our critical thinking skills applied to literative language to teach us.

We must begin to attend not to just 'what happened' but to what is *really* going on.

I have spoken to you today because you are people who care, who posess that *caritas* which our society, our world, our environment desperately needs. I plead with you and urge you to adopt a leading role in making literatve language a significant value to yourselves and to your children, to your faculty and to your students.

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Cultivating Emotional Intelligence: Strategies to Facilitate Critical Thinking

Vivian M. Rosenberg

Objectives: To persuade educators that the affective dimension of experience is an important but often neglected part of metacognition and critical thinking; to introduce instruction strategies and provide materials to improve emotional intelligence.

Content: The first component of emotional intelligence, personal psychological insight, is important in any situation, and certainly in any kind of problem solving, decision making, or learning task, both when the individual initially approaches the situation or task and then during the time he or she actively grapples with it. The second component-- empathy--is essential whenever a task or a situation involves other people, even though others may not be present. For instance, whenever we write for or to others, audience awareness (which surely depends upon some degree of empathy) is necessary for effective communication. And much of the reading we do, unless it is highly technical and scientific, is generally about other human beings. In fact, many academic courses specifically concern human behavior. This is so not only in humanities and social science courses, but also in professional courses like business management, law, or education.

In his book *Frames of Mind*, Howard Gardner identifies what he calls "the personal intelligences" -- "intrapersonal intelligence" that involves "an individual's examination and knowledge of his own feelings" and "interpersonal intelligence" that "looks outward," noticing and making distinctions among the "moods, temperaments, motivations, and intentions" of others. He notes that while "these forms of knowledge are of tremendous importance in many, if not all, societies in the world," nevertheless, "students of cognition" have tended to pay little or no attention to them.

Certainly in academia little has been done to cultivate the "personal intelligences" Gardner and others consider so crucial. In an article entitled "Criticism and Feelings," published in 1977 in *College English*, Jane P. Tompkins argued that what she called "emotional intelligence" was essential for the study of literature. Noting that "feelings about literature, and in literature, are no less illuminating than ideas," she criticized "academic critics...who seem to think that talk about the feelings is lowering, a kind of intellectual slumming...."

Writing about a very different subject--Mathematics--Douglas McLeod has called for more research into "affective issues" related to mathematical problem-solving, commenting that "teaching students about the affective variables that may be influencing them can make them more aware of limitations that they have imposed on their choice of problem-solving strategies."

More recently, two articles in the December, 1987 issue of *College Composition and Communication* emphasized the importance of the "affective domain" for writing, recommending increased research not only into the phenomenon of writing anxiety, but also into "enabling" emotional states. In fact, noted one writer, because affective awareness is an important part of metacognition, when we "help students know themselves in the fullest sense, we help them become better writers."

Although reader-response criticism and recent composition research and pedagogy have made discussion of feelings respectable at least in some English classes, I have found that simply encouraging affective awareness is not enough. Too few students (and instructors) are comfortable talking about feelings, and many don't even notice them. Social critics like Robert Jay Lifton and others have written widely on "numbing" as "the characteristic psychological problem of our age" and contemporary fiction is overpopulated with alienated men and women. It should come as no surprise, then, to find our students deficient in empathy with others and unable to recognize and talk about their own feelings.

In this workshop I introduce a program designed to cultivate "emotional intelligence." A sequence of brief exercises that can be used in any classroom directs students, in a systematic and conscious way, to focus on feelings-- to become aware of how they feel in different situations and to notice explicitly and consider how others feel.

I do not mean that college classes should become encounter groups. What I suggest is that there are systematic methods instructors can use to encourage the development and improvement of emotional intelligence. Far from distracting from course content, I argue, as McLeod does, that promoting emotional intelligence can enhance learning and make any curriculum more accesssible. Moreover, in those courses where human behavior is an integral part of the course content (e.g. literature, history, sociology, anthropology, the helping professions, etc.) empathy skills are particularly appropriate learning tools. Thus, in this workshop, we acknowledge feelings as legitimate and consider ways of introducing this topic frankly, formally, and explicitly in the college classroom.

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Teaching Literature as Rhetoric:
Critical Thinking Through the Study of Language

Alan Boye

It has been assumed that English Departments have a framework for the comprehensive study of language, but the reality is most departments are limited to two concerns: either the analysis of literary texts, or the writing of expository essays about those texts. Not only do English departments treat them as independent disciplines, but the real tragedy is that both areas have failed to substantially increase students' abilities to read and think critically.

In addition, while the study of literature and composition should be dependent on one another, the knowledge a student gains from one area does not serve adequately to reinforce the skills learned in the other. The study of literature as it is currently treated in many English departments is a confusing application of various rhetorical approaches in order to see which approach best suits a given work. While this teaching method exposes the student to a variety of ways to look at literature, it has three serious flaws.

First of all there is little in this approach to distinguish the study of literature from the study of any other kind of discourse.

Second, without a clearly defined methodology for the teaching of literature the student is often confused and disgruntled about the ultimate value of literature.

Finally, and most importantly, this application of a variety of approaches to the study of literature fails to reinforce the composition branch of the English curriculum and it fails to promote critical thinking.

Toward developing a more comprehensive framework for the study of language in our English departments we must abandon this shotgun approach to teaching literature. In short, in order to reinforce our composition courses, to increase students' ability to read and to think critically, and to allow literature to emerge as a unique form of discourse, we must redefine the methods used in teaching literature.

Most would agree that literature is a form of rhetoric and teach it with that definition in mind. The Random House College Dictionary defines rhetoric as the ability to use language effectively. George Campbell, I.A. Richards and others have echoed this definition by calling rhetoric that art by which discourse is adapted to its goals.[1] Since the fields of composition and literature are both concerned with the way in which written words affect a reader, we will use Campbell and Richard's definition of rhetoric in order to see how it might or might not apply to the modern study of the art of literature.

If, then, we define rhetoric as the art of adapting discourse to suit certain goals, the question becomes, what are the possible goals of discourse? While they overlap, the goals of discourse are largely determined by which aspect of the communications process dominates. Three important goals can easily be defined.

Aristotle argued that the goal of communication is to have a persuasive effect on the audience. This persuasive power is one of the goals of discourse. A second focus of discourse is to reflect reality. A third goal of discourse is to serve as a means of self-expression for the writer or speaker.

These three main goals of discourse--to persuade, to mimic reality and to serve as a means of self-expression[2]--are a reflection of the common approaches to literature as it is taught in most colleges and high schools today. A closer look at each of these rhetorical approaches will demonstrate why each is inadequate for the study of literature.

The most common and "traditional" approach to teaching literature concentrates on the persuasive aspects of a work. This method takes a close look at the thematic material presented in the text. It treats literature as a means of directing a message toward an audience. This method reflects the Aristotelian treatment of language as means of persuasion.

How many of us can remember writing papers, or, if we are teachers, making assignments that "discuss the author's theme in this work"? That approach has guided millions of students through the classics of literature.

I don't mean to suggest that part of the value of literature is not found in its ability to communicate to the reader some universal truth. Certainly the pleasure we derive from much literature comes in part from the didactic moral themes we discover in a novel or poem. In addition, for a student to discover an author's intent through the careful reading of a text has its obvious educational advantages.

Likewise, this concentration on the thematic elements of a work of literature can incorporate much literary scholarship. In spite of recent trends, many literature students still find a careful study of an author's biography a useful tool in "getting at" a work. In a similar fashion, a close look at the cultural, social and philosophical concerns prevalent during an author's lifetime can be a useful activity toward discovering the themes of a work.

However, while concentration on thematic concerns has directed many students to the finer works of literature, this methodology reduces the art of literature to a study of persuasive writing. Despite what our election campaigns might indicate, we must have a way of distinguishing art from advertising.

There are several dangers in treating literature as an exercise in determining the author's theme, especially if that "message" conflicts with the reader's belief. How do we deal with someone like Ezra Pound, whose poetry we might love, and whose philosophy we despise?

There is another problem in this approach to literature. The danger is the student assumes (and such "student aids" as *Cliff Notes* reinforce this idea,) that a theme can be extracted from a work of art and condensed to a paragraph or sentence without seriously affecting the "message." If this is true, why would Emily Dickinson ever have bothered with poetry. She would have been more effective writing editorials.

Another goal of rhetoric as we have defined it is to reflect reality. This goal represents the second common, but inadequate, teaching approach to literature.

In addition to studying the themes in literature, and an approach that has been active since the Neoclassicists of the 18th Century, is to see the function of literature as an attempt to reproduce nature. This way of looking at literature claims that art is an imitation of reality.

This approach is still an important one in literature classes and is best demonstrated by the example of the teacher who stands in front of a usually stunned and silent class and asks, "All right, what is this work *about*?" We ask this question because we believe that the novel or the poem is a comment on, or a reflection of reality.

The fallacy of this approach was obvious even to the Neoclassicists. Language is an inadequate substitute for reality and it can never represent a complete view of nature. In addition a strong case has been made that literature distorts and misrepresents reality. Critics such as Bernard De Voto have shown that early 20th century writers such as F. Scott Fitzgerald and John Dos Passos actually created a historically *inaccurate* view of American culture.[3]

Likewise, a proponent of this view would be hard pressed to explain how the creatures in such fantasy writings as *The Hobbit*, or the more imaginative escapades of Dungeons and Dragons, are an accurate representation of nature.

Again, this is not to say that there isn't value in searching a text for its references to reality. Such investigation is a useful tool in teaching literature. Its limits, as has already been suggested, are serious. If Emily Dickinson wanted to represent reality, why didn't she simply become a newspaper reporter and report facts?

Many of us would answer that question by saying that Emily Dickinson was much too sensitive to become a newspaper reporter. And that answer is an indication of a third direction literature classes often take discussing a work of art.

This third way of viewing literature, which reflects the self-expressive goal of rhetoric, emphasizes the mystery of intuition over the dominance of reason. The emphasis is on the individual writer's struggles toward an ideal state of self-expression, as exhibited in his or her greatest works. The documentation of this struggle in itself has become the subject of much of literature. Take, for example, the Romantics who saw in the individual act of creative expression a triumph over nature.

The manifestation of this view in the literature class can be seen in those of us who spend a great deal of time focussing our student's attention on biographical information about particular authors. In many literature classes the emphasis is on the history and social background of a period, and on the biographical and psychological background of an author.

When literature is viewed in this light, it ceases to be very much different than a simple means of self-expression. Consequently we have no *criteria* to distinguish self-expression from art. Self-expression does not require any particular artistic form.

To use poor Emily Dickinson one more time: if she just wanted to express herself, why didn't she simply keep a diary?

The reason she didn't, as we all intuitively know, is because there is a unique beauty in poetry. The reason we are happy that she didn't is because of the joy and pleasure her words now bring to us.

Whether persuasion, representation of reality or self-expression are applied separately, or collectively to Emily Dickinson's poetry, they fail to deal with this key element of literature.

Literature is a unique form of discourse. Consequently the traditional method of explaining it in terms of rhetorical goals that are more usefully applied to other forms of writing is incomplete and inadequate. In short, what makes literature literature and not some other type of discourse is its unique form.

It is in the appreciation of that form and the pleasure a reader derives from the author's craftsmanship that is literature's unique place in the world of human communications.

A fourth goal of rhetoric then, in addition to self-expression, the attempt to reflect reality and persuasion, is to create a form, an object of beauty through the use of language.

In preparing for this paper I asked many of my students and peers for a definition of literature and of art. Although their answers varied widely, there was a consistent thread. Among them all was an agreement that the structure of both literature and art drew attention to itself. Everyone also agreed that ultimately both literature and art provide us with aesthetic pleasure.

This is why we include the classics of literature in a discussion of the world's greatest works of art. The emphasis of a work of art is the object itself. It is the characteristics of the *object* that define art. In the same fashion what distinguishes a work of literature is its concentration on form. Likewise, it is the viewer's aesthetic pleasure of that form that elevates literature.

This fourth way of approaching written works of art--to concentrate on the structures of the work--is the only one that incorporates the qualities unique to the rhetorical form we call literature.

This is not to say that other forms of discourse do not indeed take on aesthetically pleasing and even artistic forms. No one can deny the beauty and artistic mastery of a writer such as John McPhee. However, the primary use of language for McPhee is not to create an object of structural beauty, but to represent nature. McPhee's primary goal is to reflect reality, whether it be the survival of a birch bark canoe, or the taste of an orange.

One can see the difference between literature and other kinds of writing as well. Take the writings of William F. Buckley. Even those who do not agree with his regressive political stands agree that Buckley's use of the English language is artistic. But again, Buckley's art only serves as a means to his goal of persuading a reader. The difference between this type of writing and literature is that the structure of literature is an end unto itself.

Literature is not a pedantic attempt to persuade, but an amoral attempt at the perfection of an object of art through the use of rational intellect. Literature is not a mere reflection of reality, but, because of its structural qualities, an imposition of additional forms on nature. Literature does not draw attention to the artist's struggles at self-expression, but to the structure of the work itself. Once we have decided that the rhetorical goal of literature is to structure language in a special way, the pedagogical implications become apparent.

The question then becomes how does one apply this rhetorical approach to the classroom study of literature?

The goal for the student of literature is to be able to distinguish aesthetic from non-aesthetic structures: in short, to be able to read works of literature critically.

The goal of the teacher of literature is to be able to demonstrate how a work may or may not adhere to certain structural patterns we have come to recognize as the genres of literature. The job of educators is to define and give shape to the extra-ordinary aspect of literature.

While all discourse uses the tools of words, sentence constructions and so forth, only in literature are those tools the primary focus. Poetry, for example uses phonemic structures more and toward different ends than other kinds of writing. In prose, plot, characterization and dialogue are combined in a particular fashion in order to create a work we define as fiction. While these same aspects might be the tools of, say, a nature writer such as Loren Eisley or Edward Abbey, only with the writer of fiction do they serve as primary focus of the work.

For the teacher, the first step is to determine what language components are stressed in a given work. This determination serves as a starting point for a rhetorical approach to teaching literature.

This does not limit the instructor to a narrow discussion of rhyme, meter and assonance but rather allows for a nearly limitless number of approaches. Structure may be discussed at any level: we may look at the grammatical structure of sentences, lines and phrases, or at the structure of an entire chapter, or of the entire book. We may look at figures of speech, or the use of particular types of narrators, at character development or plot. We may even look at the ways in which words or sentences refer to reality, or their possible persuasive effect.

All of these are valid ways of discussing the structure of a work and have been defined for us by a long history of literary criticism and linguistic studies. What remains is for the teacher to show how all of these structures are linked to one another to create the over-all form of the work. In essence we should treat the work as an entire, interconnected creature. While remembering that each level of this creature is fair game for our study.

Certainly not all creative works of poetry and fiction are classified as literature. One distinguishing factor of literature is that it deviates from the accepted norm while managing to remain within it. Therefore, after the literature teacher has determined what language components are stressed in a given work, the next responsibility is to define normal forms so that extra-ordinary and original attempts to expand upon them become visible.

We remember Walt Whitman's poetry and not Joaquin Miller's because Whitman successfully pushed the boundaries of the accepted definition of the form, while remaining within it. Miller, on the other hand, simply mimicked the tried and true definitions of poetry without pushing against them.

In order for the student to recognize the art of Whitman's poetry he or she must be aware of how it stretched the boundaries of the form. The problem with this approach is in determining what exactly was the normal way of doing things.

One solution to this problem is simple: if one knows the dominant patterns in literature one can recognize deviations from the pattern. In practice, however, this solution is problematic. It is hard to apply to a classroom of students who have a wide range of knowledge of literary traditions. It is also difficult to apply since it is dependent on the quantity of information availible about the tradition.

Another more useful method to determine how a text deviates from the accepted norm is to use texts drawn from similar cultures, from similar contexts, or to use texts of similar genres and compare these to the primary text.

This comparison can be done on many levels, from comparing lines of poetry to stanzas, to volumes. To determine the artistic qualities of Alexander Pope's "Rape of the Lock," for example, the teacher might suggest a comparison to other 18th Century English poets, or a comparison to Pope's other works, or, even, to poems of that genre from all ages.

Not relying on the knowledge of literary traditions in order to determine a work's structural vailidity forces the student to be an ever increasingly more critical reader.

There is a great deal of difference between a book such as Daniel Defoe's *Robinson Crusoe* and Defoe's *Farther Adventures of Robinson Crusoe*, or the even more obscure *Serious Reflections of Robinson Crusoe With His Visions of the Angelick World*. What constitutes those differences--what makes *Robinson Crusoe* a classic and Defoe's other attempts forgettable--is at the true nature of the rhetorical form we have come to call literature.

This is not to imply that discovering good literature is merely a matter of finding the most sensational structures and deciding that they are different.

The reader must be able to judge the work against three qualities.

A first test of the value of deviating from accepted norm is to ask if the new structure has unity. The sense of unity within a literary discourse is different from other types of writing. In literature certain settings imply certain types of characters, and they in turn suggest certain types of plots. These structural concerns must demonstrate a unity in order for us to accept the work as valid. If they don't work we tend to view the writing as less artistic. It is easy to see that at nearly any level Whitman's poetry passes this test of unity.

The second test of the value of a new norm in literary structure is to ask whether the form is appropriate. Within the context of the work items must conform to the reality created by the author. Coincidence, for example, should conform to the rules of the world created by the author. As Paul Goodman has pointed out, with each successive page or stanza, the probable outcomes of the piece should become more and more limited.[4] And yet the ending must seem both a natural outcome of what has come before and a necessary, inevitable conclusion to everything that has come before. Literature is in part a study of these patterns of probability. In this way the structure of literature can be judged by its ability to reflect reality. If a person in a novel speaks or acts "out of character" the art of that work suffers. In this context even Whitman's free-wheeling world passes the second test of appropriateness.

A third critieria for judging whether or not a work successfully pushes the limits of accepted form is to study the logic in the work. There is a logic in literature, but unlike all other kinds of writing, this logic is internal, and not confined to the real world around us. Samuel Clemens therefore may shrink humans to the size of microbes and place them under a magnifying glass, but in order for the story to work there must be laws in the universe he has created. For the story to be successful all that happens in it must conform to those laws.

For a student to be able to recognize inconsistencies in these internal laws is to begin to read literature with a critical eye.

Literature is not defined by the personality of the author, nor the particular moral concerns of a theme, nor even by the attempt to capture nature. Literature is called literature because it uses a particular pattern. It is an elegant structure of form and its creation is an attempt to press the boundaries of that structure.

To view literature in this way distinguishes it from other forms of discourse. While themes, self-expression and an attempt to reflect reality are all important to literature, it is in discerning its form that makes literature unique.

By teaching literature as a study of specific rhetorical *structures* the student learns to read with more careful eye toward discovering patterns, tropes and forms. This new awareness of form along with the traditional emphasis on the intent and referential qualities of literature allows the subject to be treated as unique and separate from other types of discourse.

Finally, this rhetorical approach to literature is an important step in rebuilding our English curriculums. Not only does a structural approach to literature encourage critical reading and critical thinking, but it teaches the student to recognize effective writing. This awareness of good writing techniques can then be incorporated into the composition programs so that these main areas of the English curriculum further reinforce each other.

Footnotes

[1] I. A. Richards, *The Philosophy of Rhetoric*, (New York, Oxford U. Press, 1965) and George Campbell, *The Philosophy of Rhetoric*, (New York, Harper & Brothers, 1885).

[2] After James L. Kinneavy, *A Theory of Discourse*, (Englewood Cliffs, NJ: Prentice-Hall, 1971) pp. 58-68.

[3] Bernard De Voto, *The Literary Fallacy*, (Boston, Little, Brown, 1944) p. 22.

[4] Paul Goodman, *The Structure of Literature*, (Chicago, University of Chicago Press, 1954) p. 14.

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Informal Reasoning in Literature Courses: The Text as Moral Laboratory

William Carroll and Jack Furlong

> In an era when individualism dominates many campuses, the challenge is to help students relate what they have learned to concerns beyond themselves. . .Individuals should become empowered to live productive, independent lives. They should be helped to go beyond private interests and place their own lives in larger context. When the observant Frenchman Alexis de Tocqueville visited the United States in the 1830s, he warned that as "individualism grows, people forget their ancestors and form the habit of thinking of themselves in isolation and imagine their whole destiny in their hands." To counter this cultural disintegration, Tocqueville argued, "Citizens must turn from the private inlets and occasionally take a look at something other than themselves."[1]

This recommendation from the Carnegie Foundation's study on the condition of American undergraduate education is the latest of several major reports on the status of teaching in higher education in this country which cite an alarming decline in the quality of undergraduate education. These studies dovetail reports sounding similar alarms at the secondary level. Yet, though both institutions are being assailed, almost all of these studies strongly recommend a closer working relationship between secondary schools and higher education, since it appears to be the very breakdown of "articulation between secondary and higher education" that abetted the decline, indeed, spread it from one institution to the other.[2]

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[1] Ernest L. Boyer, College: *The Undergraduate Experience in America,* The Carnegie Foundation for the Advancement of Teaching (New York: Harper and Row, Publishers, 1987), p. 68.

[2] In 1984 there appeared the report of the Study Group on the Conditions of Excellence in American Higher Education, "Involvement in Learning: Realizing the Potential of American Higher Education," and the National Endowment for the Humanities' report "To Reclaim a Legacy." In 1985 the National Commission for Excellence in Teacher Education's "A Call for Change in Teacher Education," and the Association of American College's "Integrity in the College Curriculum" were published. In 1986, the American Association of State Colleges and Universities and the Education Commission of the States weighed in with their own reports, and the Carnegie report, "A Nation Prepared" appeared. For a comparison and summary of earlier

Our special concern is the deterioration of humanities education in both secondary and higher education. To bridge the gap between secondary and post-secondary institutions, we have developed a program called "The Coppin-Hopkins Humanities Project in the Baltimore City Schools."[3] Ours is a synthesis between the "Great Books" approach and the recent developments in the Critical Thinking Movement. What we seek to do is to train all Baltimore City English teachers how to use classic texts to strengthen the moral reasoning skills in their students. We have developed the notion that the classroom can be used as a "moral laboratory" in which issues raised by the texts are analyzed and explored with special application to the students' lives. In this laboratory environment, the teacher is able to direct the student to a re-appropriation or thoughtful revision of traditional moral values. This paper will examine 1) the notion of the classroom as a moral laboratory, and 2) the employment of informal reasoning techniques in conjunction with classic texts as a means of enhancing the moral reasoning abilities of students.

The Classroom as Moral Laboratory

When we think of a "laboratory," we usually envision a white smocked scientist busily running from test tube to test tube with an air of importance and expectancy. We do not, however, commonly associate what happens in a humanities class with a laboratory. There is a meaning of laboratory that

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reports, see Education Under Study, Second Edition (Northeast Regional Exchange, Inc. 1983), which analyzes nine studies.

[3] This program, a partnership involving the Johns Hopkins University, Coppin State College, and the Baltimore City School system is currently training all literature teachers in the Baltimore secondary schools to teach classic texts to their students. The current project comprises three three year phases, at the end of which all city school teachers will have learned to teach Plato's *Republic*, Dante's *Divine Comedy*, and Alexis de Tocqueville's *Democracy in America*.

The project uses the three texts as models for the teaching of any classic text. Such texts are "pressure points" through which one can view an age in microcosm. In teaching Plato's *Republic*, for instance, the senior high school literature teacher will need to discuss elements of Greek history, raise questions about the meaning of certain Greek terms, and explore implications of Plato's philosophy in his very attempt to teach the literary dimensions of the work.

There are 150 secondary school teachers of literature in the Baltimore city school system. Over a period of three years, all of these will be trained 1) in the reading of the *Republic*, 2) in the use of informal reasoning techniques to enhance moral reasoning abilities in students, and 3) in the use of the classroom as a moral laboratory. The training involves an intensive five-week summer course of study on the text's historical, philosophical, and literary context as well as extensive workshops on informal reasoning techniques--using key parts of the texts as models on which to base classroom discussion. Also there are activities throughout the subsequent academic year designed to deepen the teachers' knowledge and to incorporate the text and the informal reasoning techniques into the curriculum (bi-monthly seminars featuring internationally-known figures in Greek literature and culture, and monthly visitations by professors to participants' schools). A *Curriculum Guide* unifying and improving the teaching of classic literature and culture and employing the informal reasoning techniques developed in the context of the classroom as a moral laboratory is now being developed.

does seem suited for the classroom, namely, "a place where theories, techniques and methods, as in education or social studies, are tested, analyzed, demonstrated, etc."[4] Imagine, if you will, a class on a great piece of "classic" literature such as Shakespeare's *Macbeth*. Why is such a piece of literature considered a classic? Precisely because it transcends the place and time in which it was written and speaks to all. It is a vehicle in which a particular age can be viewed in microcosm and it raises issues that have universal significance. When students encounter a classic text, they are exposed to timeless truths, universal situations confronting mankind, and the very ideas on which societies and cultures have been founded. But these texts require a careful "unpacking," layer by layer, so that ideas and issues brought forth can be digested--accepted or rejected. The following is a sample text from Homer's *Odyssey* which provides a good example of how the classroom can be used as a moral laboratory.

> I might have made it safely home, that time,
> but as I came around Malea[5] the current
> took me out to sea, and from the north
> a fresh gale drove me on, past Kythera.
> Nine days I drifted on the teeming sea
> before dangerous high winds. Upon the tenth
> we came to the coastline of the Lotos Eaters,
> who live upon that flower. We landed there
> to take on water. All ships' companies
> mustered alongside for the mid-day meal.
> Then I sent our two picked men and a runner
> to learn what race of men that land sustained.
> They fell in, soon enough, with Lotos Eaters,
> who showed no will to do us harm only
> offering the sweet Lotos to our friends--
> but those who ate this honeyed plant, the Lotos,
> never cared to report, nor to return:
> they longed to stay forever, browsing on
> the native bloom, forgetful of their homeland.
> I drove them, all three wailing, to the ships,
> tied them down under their rowing benches,
> and called the rest: 'All Hands aboard;
> come, clear the beach and no one taste
> the Lotos, or you lose your hope of home.'
> Filing in to their places by the rowlocks
> my oarsmen dipped their long oars in the surf,
> and we moved out again on our sea faring.

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[4] *Webster's New World Dictionary, Second College Edition*, p. 785. We suspect, however, that the framers of this definition had in mind educational laboratories traditionally associated with teacher education. This is not the meaning we intend here.

[5] The cape at the southernmost end of Greece; Kythera, mentioned two lines below, is a sizable island just southwest of Malea.

The text depicts one of the adventures encountered by Odysseus, ruler of Ithaca, and his men in their attempt to return home after the Trojan War.[6] Odysseus has put ashore in the land of the Lotos Eaters. He sends three men to explore the area and to ascertain what "race" of men inhabited the area. These men encountered the Lotos Eaters, named because of their addiction to the pleasures encountered from eating the Lotos plant. The men are quickly drawn to the plant and quickly succumb to its intoxicating qualities; in fact, their very being is taken over by the plant. Odysseus seizes the men, places them in chains on the ship, and returns to the high seas to continue his voyage home.

For our purposes what is important in this text is its applicability to one of the major problems encountered by today's students--drug use.[7] The teacher has the opportunity--as a result of this text--to examine this most difficult problem. What we suggest, however, is not merely a discussion of the pros and cons involved in drug use (both by Odysseus's men and the students) but a formal examination of the pros-cons of drug use and the possible sub-conscious motivations that provide students "permission" to use drugs. The classroom now becomes a laboratory wherein students can openly and under the guidance of the instructor, test the feasibility of drug use. All possible positions should be examined with an air of openness, respect and honesty (no student's position is too trivial or simplistic to be considered).[8] Through discussion, the teacher serves as a guide, gently leading and directing the students through the maze of possibilities. Questions that might flow from this text include: What's wrong with eating the Lotos Flower? Doesn't the individual have a right to decide what he/she ingests? Did Odysseus have the right (and obligation) to imprison the men for their own good? Does society have a right to forbid us to take drugs? What is wrong (or right) with taking drugs? If someone takes drugs, should his/her family (or the state) step in and protect them from themselves (as Odysseus protected his men from themselves)?

Obviously, the text cited above has brought us into one of the most difficult and inflammatory issues which teachers may encounter. Although in many cases such discussions may be avoided (because they are too inflammatory and there is no clear answer), we suggest they need to be embraced and even fostered. As educators we are confronted with the problems of how to prepare our students to deal with moral situations. In the past we have assumed that such matters were the province of the home, but this scenario appears to be no longer the case. As a result, teachers are expected to assume many of the responsibilities formerly handled by parents. If our society is to continue to maintain the ideals which it holds dear, the classroom must now assume much more responsibility for the moral education of our youth.[9] If the students are not able to examine positions in the classroom (as moral laboratory), where can they discuss them? In a non-existent home environment? On the street with one's peers? With the drug dealers?

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[6] The trouble began when Helen, wife of Menelaus (King of Sparta), was spirited off by the Trojan prince Paris. This prompted a Greek expedition to Troy to seek revenge. It is now ten years after the war and Odysseus is presumed dead. Suitors have overrun his house in their attempt to court his attractive wife, Penelope. As a result, the political position of his son, Telemachas, has been jeopardized, and his estate is on the verge of bankruptcy.

[7] Certainly, we are also interested in the study of the text in itself--the literary form, the historical setting, the author, the relationship to other texts of the period, etc. However, for purposes of this article, we are focusing on the use of classic texts as moral laboratories.

[8] The value of open and honest discussions has been most recently championed by The Touchstone's Project of Annapolis, MD.

But are teachers prepared to shoulder this responsibility? What kinds of training have they received that would enable them to be moral educators? Though there is no agreed upon curriculum by which one becomes a moral educator, teachers can be "moral educators" without becoming involved in a quagmire of controversy around the content of the moral curriculum. As teachers in this society, we have as our responsibility the reinforcement of those values that gird the society.[10] But how do we train teachers to teach students societal values without appearing effete or ministerial? In fairness to teachers, graduate programs have not prepared them for discussions of this sort. Rather, they have been trained to explicate faithfully the texts much in the manner of their major professors. The idea of using the text as a moral laboratory may never have been discussed. In what follows, we will outline a method for enhancing students' moral reasoning skills using classic texts and methods garnered from informal logic and cognitive psychology.

Enhancing Moral Reasoning Skills

No one enters a classroom as a moral neophyte--neither instructors nor students. We all have been involved in moral decision-making[11] during the course of our lives; that is, we have confronted pivotal "right or wrong" situations which require decisions on our part. But how do we make these decisions? What mental apparatus swings into motion when we confront a moral crossroad? Although it is impossible to be taught *what* to decide, perhaps by focusing on the *how* to decide will get us clear on the *what.*

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[9] For a thorough and thought-provoking analysis of moral education, see Betty A. Sichel, *Moral Education: Character, Community, and Ideals* (Philadelphia, Temple University Press, 1988).
[10] See John Furlong and William Carroll, "Some Thoughts on the Issue of Neutrality and Its Relation to Teaching Thinking," *Proceedings of the 1988 SAPEA Conference.*
[11] Morality refers to the rightness or wrongness of actions as determined by a society's customs and mores. Moral decision-making is an act whereby an individual is forced to choose between several courses of action. Interestingly, when it comes to moral decision-making, an individual cannot decide not to decide; no decision is itself a decision. For the relationship between morality and ethics, see Richard T. DeGeorge, *Business Ethics* (New York: Macmillan Publishing Co., 1982), pp. 11-14.

I. Teaching Morality through Classic Texts

As stated at the outset of this paper, the Coppin-Hopkins Program represents a melding of two prominent movements in education: the Great Books approach and the renewed emphasis on the explicit teaching of thinking. By dint of the classic texts we have chosen, the content of our teaching involves moral issues. Besides increasing students' knowledge, the major aim of our project is to make students' thinking about moral issues less egocentric, rigid, impulsive, and more sensitive to ideals of our culture. We therefore presuppose the truth of a certain set of values or ideals--honesty, rationality (the necessity to be consistent, relevant, and complete in one's reasoning), fairness, respect for persons, self-discipline, the insight that self-respect is developed, or helped along, by realizing that one can learn to reason well. These values correspond generally to a number of the character and citizenship objectives found in the *Report of the State of Maryland Values Education Commission.*[12]

We also take a stand on the current debates about the uses of great books--they are, for us, sources of inspiration as well as common cultural knowledge ("cultural literacy"). But they are also superb occasions for teaching students the craft of thinking-- especially developing in them the habit of thoughtful reflection on their own behavior. "What is Socrates to me?" the student might ask. Our answer would be: many things--a cultural hero, a name that every educated person should be able to identify along with other information (Plato, the dialogue, Socrates' death, "the unexamined life is not worth living," etc.), but also the embodiment of the practice of careful moral reasoning.[13]

II. The "Assessability" of Moral Reasoning

What we think most "assessable" in our project--apart from increased knowledge of the ancient world--is the enhanced ability to reason clearly about moral issues. For our purposes, a person who is good at reasoning about moral issues is able at the very least to produce a number of good reasons for his/her position and objectively to represent and compensate for good reasons of an opposing position.[14] The "form" of this reasoning is often called "informal" or "everyday" reasoning by philosophers.

The Harvard Project Zero Group, led by David Perkins, has been studying the nature of everyday reasoning for several years now.

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[12] Specifically, Character Objectives 1, 6, 7, 10, and Citizenship Objective 2. See this Report, January 5, 1979, Maryland State Department of Education, pp. 1,2.

[13] See John Furlong and William Carroll, "Teaching Justice Through Classic Texts: The Coppin-Hopkins Humanities Program in the Baltimore City Schools," *Proceedings of the South Atlantic Philosophy of Education Association*, Duke University, October, 1987.

[14] The much-praised Hastings Center monographs on the teaching of ethics especially emphasize the role of moral reasoning in developing a "moral point of view."

> The developer of an informal argument must take care to consider multiple lines of argument on both sides of the case, explore thoroughly his or her knowledge base for whatever seemingly unrelated knowledge might apply, doubt the premises, and examine with more than a formally critical eye inferential steps. [15]

Perkins and his team measured increases in the ability to reason "informally" along three criteria:

1. Lines of Argument: a count of the number of reasons a person produces pro and con on an issue.
2. Quality of Argument: an overall quality rating on a five- point scale.
3. Objections: a count of the number of lines of argument subjects gave on the other side of the case.

As a working definition, then, we describe increase in everyday reasoning ability as the overall increase in ability to produce more good lines of argument for a position while compensating for possible objections. The Project Zero team discovered that the greatest improvement in everyday reasoning occurred when, by Socratic questioning techniques, "an expert guides and supports the performance of a novice just enough to keep the novice moving adequately on the task." In effect, during the experiments, "the experimenter (expert) functioned as a metacognitive guide, providing a strategic sequence of questions designed to push reasoning deeper."[16]

Moral reasoning, then, is everyday reasoning with a certain type of content and set of warrants. Using Perkins' work as a guide, we focus on the developing of good moral reasoning as we have defined it. Employing the general issue of justice for persons and states as posed by Plato's Socrates in the dialogues, for example, the Coppin-Hopkins teachers are trained to act as "metacognitive guides" or Socratic "midwives," attempting to increase the student's ability to produce more lines of argument of good quality constrained by objections--to justify moral attitudes or behavior. Teachers are trained in questioning techniques and response strategies. Through high school visitations and bi-monthly sessions, the teachers have developed classroom materials that are used during the regular school year.[17] That is, using the *Republic* as a model, they have developed curriculum units that focus on enhancing moral reasoning through classic texts. To evaluate the success of the unit, the teachers have constructed "writing prompts" at the beginning of each unit in which students are confronted with a moral situation and forced to develop reasons for a particular position. The following is a prompt developed by the teachers this summer and now being used in the Baltimore City Schools.

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[15] David Perkins, "Reasoning as It Is and Could Be: An Empirical Perspective." Presented at the American Educational Research Association (AERA), April, 1986, p. 4. See also Perkins, Allen and Hafner "Difficulties in Everyday Reasoning," in William Maxwell (ed.) *Thinking: The Expanding Frontier* (Philadelphia: The Franklin Institute Press, 1983), pp. 177-190.

[16] Perkins (1986), p. 12. See also P.M. Greenfield "A theory of the teacher in the learning activities of everyday life." in B. Rogoff and J. Lave (eds.) *Everyday Cognition: Its Development in Social Context* (Cambridge: Harvard University Press, 1984) pp. 117-138.

[17] During the summer, teacher participants meet Monday - Wednesday. Mondays and Tuesdays are equally divided (total = 4 hours) between lectures on the *Republic* and workshops on reasoning techniques. These workshops are further divided into one hour of lecture on

> Suppose that you found a book entitled *A Complete History of Baltimore*, and the publication date was 2200. You took the book home, read it, and discovered that all the events described were absolutely correct up to the present year. You also read about a terrible fire occurring in April of 1989. When you woke up in the morning, the book was gone, but your memories of the fire which would destroy much of the city and kill thousands of people were very clear. Write a speech that you could give the Mayor and the City Council convincing them that they must listen to you about this catastrophe.

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reasoning techniques and one hour of small group work. The groups' goal are to develop actual curriculum units for use in their classrooms. Accordingly, a sample summer schedule might look something like this:

Monday-Tuesday

Week One: While working on Books I and II of the *Republic*, teacher participants practice clarification and definition using the byplay of Socrates and Thrasymachus. Use of Socratic questioning techniques to stimulate a class to clarity, define, distinguish are introduced.
Week Two: While working on Books III and IV, teacher participants practice what informal logicians often call argument analysis: exploring what makes a reason a good one. For example, Socrates' Noble Lie might be explored as an occasion for examining some requirements for good reasons. Perkins's work on the quality of an argument is used as a model.
Week Three: While doing Books V and VI, argument analysis is practiced further, this time accenting the production of a number of different reasons--what Perkins calls "lines of argument." A good topic in this week might be the relationship between the philosopher and the city: why must the best rule? Ways of coaxing students to develop more lines of reasoning than they think themselves capable of are examined.
Week Four: While working on Books VII and VIII, teacher participants examine how one anticipates and formulates objections to one's position. For example, Socrates' discussion on the relationship between virtue and good government, as well as numerous other texts showing Socrates handling objections are investigated. The week ends by showing how clarification, development of a number of good lines of argument and handling of objections might be used to show students how to structure an essay.
Week Five: Books IX and X are examined and participants continue to work in small groups to finish their curriculum units.

Wednesdays

Seminars on the *Apology, Origins of Greek Thought* and *Antigone* plus a Seminar or Practicum focusing on using Socratic techniques in the classroom.

> Before writing you should think about your reason for giving the speech and at least two convincing arguments to make them believe you.
>
> Now write your speech for the Mayor and City Council.[18]

At the end of the unit, a similar prompt is given and the quality and quantity of reasons from the first prompt are compared for increase using the three criteria developed by Perkins.[19]

Between the pre and post prompts, 1) students are introduced to a classic text (e.g., sections of the *Republic*, the *Odyssey*, etc.); 2) the text's context, characters, theme, etc. are analyzed; 3) moral issues are isolated; 4) students are taught to clarify the issues involved, isolate reasons developed by the author, and evaluate these reasons for relevance and adequacy; and 5) students develop objections to positions raised by the text. The following graphic organizer provides an overview of the process from pre- to post- prompts.

To teach "The How To Reason Better" component, we use the following "Reasoning Frame."

The "Frame" outlines the reasoning process and seeks to indicate that the process is not static and lifeless but a dynamic process of inter-related and inter-connected parts. Using the "Reasoning Frame," teachers demonstrate to students the process of developing reasons that eventually lead to a conclusion. These reasons themselves must be backed by evidence and undergo the tests of "relevance" and "adequacy."[20] Finally, students are encouraged to look at the implications and consequences of the conclusion. Although the "Reasoning Frame" is first taught in the context of situations arising from a classic text, the applicability in everyday situations becomes clear.[21]

As we conclude our paper, we want to accent the complexity of the problem which we are trying to address. We are trying simultaneously to do two things at once: to increase students' knowledge of how to read and understand primary texts while enhancing their abilities to reason clearly about the moral situations and quandaries that such texts always force one to confront (in the text itself and in the students' daily lives). Although the model we have presented in this paper has focused on literature courses, moral education is a job for all of us. As Betty Sichel emphasizes in her recent study, moral education is endemically multi-disciplinary.

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[18] We wish to thank Alan Hefter, Jacqueline Mason, Karen Muller, Claudine Whitley and Maxine Pathi, teachers in the Baltimore City schools, for developing this prompt.

[19] We are indebted to Mr. Robert Embry, President of the Abell Foundation, for his constructive criticisms and suggestions concerning evaluation of the project.

[20] "Relevance" is associated with the quality of the reason; "adequacy" anticipates and encounters possible objections to the reasons.

[21] This "Reasoning Frame" has been adopted by the Baltimore City Schools to teach expository writing.

> Moral education is not a distinct, wholly separate discipline and cannot be understood through the tools and resources of any one discipline. Rather, it exists at the intersection of many disciplines. An adequate philosophy of moral education must not only be cognizant of this interstitial status, but of the various disciplines that touch on that intersection. The major themes of moral education cannot be discerned by following a single strand, but must be based on an intricate, coherent tapestry woven from many diverse threads.[22]

In our particular part of this tapestry, we work with many threads. What maintains the integrity of the weave, we hope, is our assumption that students are moral agents and that what we learn from great works of literature should make some difference to the way they live their lives.

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[22] Betty A. Sichel, *Moral Education: Character, Community, and Ideals*, p. 14.

The Pedagogical Implications of Normalization and Representation in Mathematics Learning

Joan B. Stone

Suppose, instead of asking what is the nature of mathematical achievement of deaf kids, we asked what are the conditions under which such a question would even be raised? Does such a question, admittedly derived from Foucault, help us to see alternative practices that we would be unable to see otherwise?

Both Paulo Freire and Michel Foucault have suggested that a fundamental theme of the present time is domination, domination of the developed countries over countries of the Third World, domination of one race over another, domination of men over women, and domination of physically and mentally healthy people over those with disabilities. The forms of domination are diverse and subtle, sometimes reminiscent of the ancient power of monarchy, but more often assuming a guise of what Freire (1985) calls manipulative paternalism or what Foucault (1983) refers to as pastoral power. For those of us who work with deaf individuals and who communicate using a combination of sign language and English, Hilde Schlesinger (1987) points out that the sign for oppress is a mirror image of the sign for help and that it is possible to say the English word help at the same time one signs the word oppress. There is perhaps no area in which the diverse forms of domination converge more powerfully than in the field of science and technology. By definition, a developed country is more technologically advanced than a Third World country. The dominance of white males over women, blacks, Hispanics, disabled people in science and technology has been established empirically. In its efforts to help deaf people gain access to the fields of science and technology, the National Technical Institute for the Deaf has been swimming against the current of contemporary culture for the past twenty years. Credit should be given to the individuals who have argued successfully in Washington each of those years that deaf people, who are employed, pay taxes and the better the jobs, the more they contribute to the economy. Perhaps the paternalism in that argument can be excused because the existence of NTID is a precondition for a critical analysis of the domination of deaf people.

Foucault suggests that one way to understand how domination works is to analyze the forms of resistance to it. The study of resistance is not a new idea in education. Paul Willis' (1981) study of working-class students in Great Britain is a classic in this area. Hilde Schlesinger's work has suggested that many of the apparent social and cognitive inadequacies demonstrated by some deaf students may in fact be forms of resistance to the experience of domination. Daniel Stern's work with young infants suggests that even very young infants resist the domination of powerful parents by looking away. The same resistance occurs in deaf students who must look in order to communicate. Schlesinger suggests that an active form of resistance has occurred when deaf students communicate over wide distances thereby controlling the space in between and making any movement into that space an intrusion. Such active and passive forms of resistance to perceived domination should not be confused with true cognitive inadequacies that result from difficulties related to deafness. Sorting out the instances of resistance from cognitive difficulties is not an easy task.

Language difficulties are a major consequence of deafness. That language functions as a tool of resistance and domination as well as a tool of cognition further complicates the situation of deaf individuals. When we situate all of this in a context of technical education, a foundation of which is mathematics, we have an incredibly complex problem. In order to sort out some of these complexities, I will examine three interrelated ideas. First, I will examine the role of normalization in a process of domination, particularly as this occurs in the mathematics and technical education of deaf students. Second, I will examine the function of representation in mathematics learning and specifically how this function may or may not be affected by the language difficulties that are common to many deaf students. Finally, I will look at pedagogical alternatives which may hold some promise for overcoming domination and for enhancing the function of representation for mathematics learners with language difficulties.

Normalization

Individuals with disabilities have suffered the effects of normalization for a long time. Deaf people in particular have resisted the steady "progress" of technology and educational theory toward normalization. Many deaf students, by the time they reach high school, have chosen not to use classroom amplification systems no matter how technically sophisticated those systems may be. Many members of the adult deaf community resist the effort to mainstream young deaf children. The resistance both to mainstreaming and to audiological technology is often described in terms of resistance to normalization. In resisting normalization, what these individuals are also resisting is the characterization of deviance. When there is no norm, it is impossible to be deviant from it. The fact of normalization is deeply embedded in our practices and our language. Why should it be that people who can perceive sound in the speech range are called "normally hearing," while those who cannot are called deaf or hearing impaired? If normalization was simply a numerical process, that is, if people were called normally hearing because they heard sounds that most other people could hear, then there would be little reason for concern. Unfortunately, what goes along with the concept of normalization is what is good for the majority must also be at least tolerated by everyone else. At best, everyone else should strive to be like the majority. It is interesting to explore the subtle ways resistance to normalization occurs. Is it really cognitive limitation that holds the reading levels of deaf students at a certain point? We have always assumed it was. Perhaps we need to question whether or not resistance to normalization is operating here. When learning to read is only to be like hearing people (or white people or English-speaking people), then maybe what is operating is resistance to being normalized. Research[1] indicates that people in those "deviant" categories learn to read more effectively and efficiently when there is something in it for them. Learning to read to be like the white man (or the hearing man) is seldom incentive for people whose egos are intact. It is possible that resistance is a sign of strength, not a problem to be overcome.

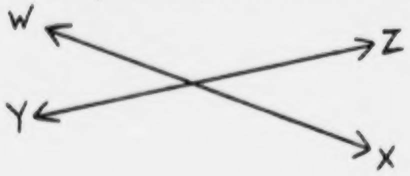
Although the experience of resistance to normalization is very familiar to disabled people, it is not unknown to anyone. The process of schooling in the U.S. is one of normalization. Schools are established on principles of expected, regulated development. Intellectual development is assumed to proceed in a reasonably orderly fashion not unlike physical development. When it does not, mechanisms are in place to deal with the problem. We know when development is not proceeding in the expected fashion because we have a vast system of measurement in place which tells us that, e.g. the Iowa tests, the Stanford, the California reading test, etc. It is an open question whether or not such tests have defined what intellectual development is, i.e. are they simply operational definitions of development itself, or is there something we can point to and say, "That is development"? The two major academic areas which are used to indicate intellectual development are reading and mathematics. Because we have assumed a "normal" developmental pattern, we are always in the position of having to say that half of the kids in the country are below the mean in reading level or mathematics performance. If one falls too far below the mean, he or she risks falling into the psychiatric category[2] of "developmental arithmetic disorder." No matter how bright a young deaf student may be, no matter how well adjusted, no matter how great his ego strength, he still is very likely to fall into at least two or three categories of "deviance." Again, resistance to such categorization may represent a strength to be capitalized on, not a weakness to be overcome.

Representation in Mathematics

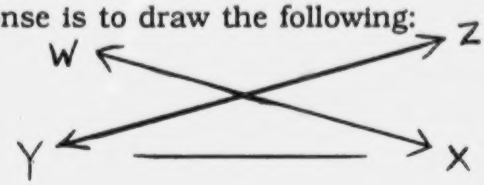
Studies reported by Moores (1978) and Wood et al. (1983) indicate that deaf students do not do as well in mathematics as their hearing peers. In a study of 414 sixteen year old deaf students in England, Wood et al. found a difference of about 3 years in achievement level. Similar results have been reported by Moores and others in the U.S. Although there is clearly a delay in the achievement of deaf students, this delay does not appear to be related to the degree of hearing loss. There was essentially no correlation between achievement level and degree of hearing loss among Wood's subjects. There was, however, a high correlation between degree of hearing loss and verbal, linguistic ability. These two results are interesting because they suggest that the symbolic, representational function in mathematics is quite different from verbal, linguistic ability. The results suggest that we should be careful about the ways in which we use verbal language as a model for symbolic, representational functioning in mathematics. There is some reason to believe that the symbolic, representational processes used by deaf students in mathematics are not all that different from those used by hearing students. Wood et al. found similar error patterns in both deaf and hearing students. Deaf and hearing students seemed to have the same level of metacognitive awareness, i.e. both deaf and hearing students seemed to know what they didn't know in mathematics. The same is not true on tests of verbal ability. Deaf students demonstrate less awareness than hearing students of their own cognitive functioning on such tests.

The fact that the mathematics achievement of deaf students is delayed may be due to less time spent on mathematics instruction in programs for deaf students than in programs for hearing students. Or it may be due to fewer teachers who are well-qualified to teach mathematics in programs for the deaf than in programs for hearing students. Even in mainstream programs, mathematics may often be taught by the teacher of the deaf. It is undeniable that spoken and written language is a problem for deaf students. The relationship between that well known problem and symbolic representation in mathematics has really not been explored. The following problem has been difficult for deaf students:

"Given WX and YZ below, can you draw a third line that does not intersect either WX or YZ?"



A common response is to draw the following:



If we analyze the question, we find a condition stated at the beginning of the sentence which ordinarily would be troublesome. In this case, the condition is supported by the diagram and in fact it may or may not even be read. It is not necessary to read the condition if one looks at the diagram. The problem with this question is not the English language form in which it has been written. Instead, the problem is related to symbolic representation in mathematics. The mathematical meaning of the word *line* must be understood. The student must know that a line extends indefinitely in either direction, and in this way it is different from a *line segment* which is what he has drawn. The student also needs to know that the arrow symbol is a mathematical symbol for the word line. He or she needs to be able to imagine the lines on the paper extending far beyond the boundaries of the page. So, although the question seems to be about the picture that is actually on the page, it really is about objects for which the picture is only a partial representation. The student has been asked a question for which the possible graphic representations are necessarily inadequate in and of themselves. In order to be understood, mathematical representations require a leap of imagination. As reasonably successful mathematicians, most teachers make such leaps themselves, but not always with an awareness that they are doing so. It may be necessary for us, particularly as teachers of deaf students, to become aware of the complexity of the representations we use so automatically in instructional situations.

Pedagogical Possibilities

From a constructivist point of view, mathematical representations are not ideal forms to be found on the walls of caves. Instead they are the constructions of people, interacting with each other, and finally agreeing that such and such will be the mathematical representation of such and such. In this way, mathematical representations are not so different from spoken and written language, yet their use does not seem to be dependent on hearing in the same way that the use of spoken and written language is dependent upon hearing speech. The exception to this may be those mathematical representations which are related to temporal events. The research on mathematical achievement of deaf students has demonstrated that there is no direct link between the ability to use mathematical representations and the ability to use spoken and written language. However, the extent to which mathematical representations are consensual and developed out of interactions among people is not all that different from the way in which language develops. It would seem that if we wanted to enhance an individual's ability to understand and use mathematical representations then it would make sense to provide him or her with opportunities to interact with others who understand and use those representations. The developmental psychology of Vygotsky and the pedagogical methods of Freire both provide support for the importance of dialogue and suggest ways in which such dialogue can occur in classrooms. Both Freire and Stephen Brown have used the words "problem posing" in relation to classroom dialogue. Problem posing is a difficult instructional technique for most of us. It requires a confidence in our own mastery of the content we are teaching that frequently we do not feel. Freire used the method of problem posing in his efforts to teach illiterate peasants in Brazil to read. Brown, who is a confident teacher and mathematician, uses the method in mathematics classrooms. What results from problem posing is a deeper understanding of the complexities of a situation than could have been predicted. Raffaella Borasi has extended Brown's problem posing idea in order to examine with her students the errors they make in mathematics. She uses those errors very specifically to reveal intricacies that might otherwise be overlooked. Because they work from their own errors with a sense of possibility instead of failure, her students become surprisingly engaged in the process of understanding mathematics.

It is interesting to think about how the previous problem with the intersecting lines could be handled so that the student really has an opportunity to see what the teacher already knows. It is even more interesting to think about how such a problem could result in deeper understanding on the part of the teacher. The essential contradiction in the graphic representation of an infinite object was a surprise to me when I encountered the student's response. The question now for me and that student is what does such a contradiction mean in terms of our understanding of mathematical representation generally? Such questions are important to both of us, and they come up frequently in classroom interactions. We need to learn how to notice them and make use of them to deepen our understanding.

In what kind of a classroom could such interactions occur? This is certainly an open question, and one which I would like to investigate. I do suspect, initially at least, that among the conditions for such interactions would be an environment free of domination and an environment where deviance was welcome and perhaps even celebrated. If kids are ever going to develop much of an understanding of mathematics, we may have to let go of the idea that there is a "normal" pattern of development within which half of us move rather slowly and the other half move rather quickly.

Postscript[3]

This paper has addressed a different sense of the words, *critical thinking*. This is not the cool, disinterested logic of Ennis. If my concept of critical thinking is close to any of those acknowledged in the field, it would probably be nearest to the disciplinary context of McPeck. But I think I would go even farther. Context is not simply an aspect of critical thinking to be accounted for. Without a world in which to act on one's thought, that thought might be called logical, but it can hardly be called critical.

I want to take seriously the definition suggested by Harvey Siegel. "Critical thinking is the capacity to be appropriately moved by reason." George Hole claims that Siegel does not address the competitors to critical thinking, namely tradition and passion. I would agree that Siegel's slogan seems to be ignoring tradition, if not dismissing it entirely, but I think that his definition co-opts passion. "To be moved" are words we ordinarily use to describe emotional response, not rational thought. I am moved by the sun rise or by my son's cheerful response to my phone call. I am moved by the driver who cuts me off on the expressway. Occasionally, I might say that I was moved by the force of an intellectual argument, either to be thoroughly convinced by it or more frequently to be angered by it. That anger often moves us to our feet to challenge a point at conferences on critical thinking. But critical thinking itself is a concept that seems as though it should have more payoff than that. As an exercise in pure reason, critical thinking may be a technique we would want our students to employ as they encounter our disciplines. But I would turn it around. The critical question is not how critical thinking can help us better understand mathematics, but how mathematics, or history or literature can help us understand the world with all of its social, political, and economic contradictions.

Notes

1. My colleague, Professor Kathleen Crandall, has observed that motivation to become more proficient in English and actual achievement in English both increase after students at the National Technical Institute for the Deaf return to classes from cooperative work experiences.

2. "Developmental Arithmetic Disorder" is code number 315.10 in the 1987 edition of the *American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders.* "The purpose of [this manual] is to provide clear descriptions of diagnostic categories in order to enable clinicians and investigators to diagnose, communicate about, study, and treat the various mental disorders."

3. There's good news and bad news when you find yourself scheduled toward the end of a conference program. The bad news is that people have left by the time you're on. The good news is that you have an opportunity to comment on the presentations of others. This "postscript" is the result of having heard Harvey Siegel's presentation and the comments made by some of my colleagues in response to it.

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